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THE UNIVERSITY OF ALBERTA

A STUDY OF SELECTED FACTORS RELATED TO THE
INNOVATIVENESS OF ELEMENTARY SCHOOL PRINCIPALS

by

GUY BERTRAND MARION

A THESIS

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The undersigned certify that they have read and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Study of Selected Factors Related to the Innovativeness of Elementary School Principals" submitted by Guy Bertrand Marion in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

ABSTRACT

One of the major problems in education today is the rapidity with which schools must adapt to changing social conditions. This requires that we know what social factors facilitate or hinder the introduction of new educational practices into our schools. However, one of the key figures in our schools is the principal. Consequently, a knowledge of the personal factors of this key figure in each school becomes necessary.

The purpose of this study was to investigate the relationship between a number of personal factors of the principals and social factors of the schools, on the one hand, and educational innovativeness, on the other.

Ten hypotheses were derived from Rogers' theory and from research on the diffusion and adoption of innovations in various research traditions. In order to test these hypotheses, data were collected on the principals and on the public elementary schools of a large city in Western Canada, through questionnaires, interviews, and documental records. Only principals whose schools were large enough to allow release from teaching at least seventy per cent of the time were included in the sample. Moreover, only those elementary schools where Junior High classes did not constitute any more

than twenty per cent of the total number of classes in the school were selected. The independent variables investigated were anxiety, values, dogmatism, mental rigidity, professionalism, cosmopolitaness, opinion leadership, education of the principal, and social system norms on innovativeness.

Taylor's Manifest Anxiety Scale, Prince's Differential Values Inventory, Rokeach's Dogmatism Scale, and the F_x Scale of the California Psychological Inventory were used to assess the first four variables respectively. Professionalism, cosmopolitaness, and opinion leadership were measured through questionnaires designed or adapted by the investigator. Norms on innovativeness were assessed through the "judges' ratings of norms" method. The dependent variable, innovativeness, was assessed by means of two indices. A principal's score on the First Index of Innovativeness was obtained on the basis of the number of innovations he had adopted from the five under consideration: departmentalization in grades four, five, and six, the use of consultants, parent-teacher interviews, French instruction in grades five and six, and the use of television. The Second Index of Innovativeness, comprised of the same five innovations, was a measure of extent of use of the five practices.

It can be concluded from this study that the

innovative principal, whether using the First Index or the Second Index of Innovativeness as the criterion, tends to be younger than his fellow principals, to be cosmopolite, more professionally oriented, to be influential among his fellow principals, to be mentally flexible, to be viewed as highly innovative by other principals and to have recently taken university courses. The innovative principal usually works in a school situated in a higher socio-economic area of the community, staffed by teachers who favor the adoption of new educational practices. The amount of education of the principal, his dogmatism, anxiety, his values and the size of the school seem to bear no relationship to his innovativeness.

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TABLE OF CONTENTS

CHAPTER	PAGE
I. THE THEORETICAL FRAMEWORK	1
Introduction	1
Statement of the Problem	2
Background of the Study	2
Rate of Change in Education.	2
Acceleration in Change Rates	5
Importance of the Study	7
Rogers' Theory	9
Introduction	9
The Paradigm	13
The Process of Adoption	16
Elements of Diffusion and Definition of	
Terms	16
Research Traditions	22
The Education Research Tradition	23
A Convergence of Tradition	25
Adoption as a Process	27
The Five Stages	29
Overview of the Report	32
II. THE DEPENDENT VARIABLE	33
Introduction	33

CHAPTER	PAGE
Selection of the Innovations	34
The First Index of Innovativeness (I_1)	35
Departmentalization	35
Consultants	36
Parent-Teacher Interviews.	37
French Instruction	38
Television	38
The Second Index of Innovativeness (I_2)	41
Departmentalization	41
Consultants	42
Parent-Teacher Interviews	43
French Instruction	45
Television	45
III. THE INDEPENDENT VARIABLES.	47
The Choice of Independent Variables.	47
Anxiety.	48
Review of the Literature	48
The Instrument	51
Values	53
A Definition of Values	54
Ideal Types	56
Review of the Literature	58

CHAPTER	PAGE
The Instrument	60
The Hypothesis	64
Dogmatism and Mental Rigidity	65
Introduction	65
Rokeach's Work	66
Review of the Literature	75
The Gough-Sanford Rigidity Scale	75
The Hypotheses	77
Social Status	78
The Theoretical Background	78
Review of the Literature	80
The Instruments	82
The Hypotheses	84
Cosmopolitaness	84
The Theoretical Framework	84
Review of the Literature	87
The Instrument	89
Scoring the Index of Cosmopolitaness	90
The Hypothesis	91
Opinion Leadership	91
The Theoretical Framework and Review of	
the Literature	91
The hypotheses	99

CHAPTER	PAGE
The Instrument	99
Norms on Innovativeness	101
The Theoretical Framework	101
Review of the Literature	102
The Hypothesis	105
Methods of Assessing Group Norms on Innovativeness	105
Method Used in This Study	106
The Hypotheses	107
Hypothesis One	107
Hypothesis Two	107
Hypothesis Three	108
Hypothesis Four	108
Hypothesis Five	108
Hypothesis Six	108
Hypothesis Seven	108
Hypothesis Eight	108
Hypothesis Nine	109
Operational Definitions	109
Anxiety	109
Values	109
Dogmatism	109

CHAPTER	PAGE
Mental Rigidity	109
Education	109
Professionalism	110
Cosmopolitaness	110
Opinion Leadership	110
Social System Norms on Innovativeness	110
Innovativeness	110
Limitations, Assumptions and Delimitations	111
Limitations	111
Assumptions	112
Delimitations	113
IV. DATA SOURCES, COLLECTION AND TREATMENT	114
Selection of the Sample	114
Collection of the Data	116
Completion of Questionnaires	116
Interviews	117
Socio-Economic Level	118
Examination of Records	120
Characteristics of the Respondents and of	
the Schools	120
The Respondents	120
The Schools	124

CHAPTER	PAGE
Statistical Treatment	125
Normalizing	125
Summary	128
V. RESULTS, ANALYSIS, AND DISCUSSION	130
MAS Scores and Innovativeness	130
Testing Hypothesis One	130
Discussion of the Findings	132
Traditionalism and Innovativeness	136
Testing Hypothesis Two	136
Discussion of the Findings	138
Dogmatism and Innovativeness	139
Testing Hypothesis Three	139
Discussion of the Findings	143
Mental Rigidity and Innovativeness	144
Testing Hypothesis Four	144
Discussion	146
Related Findings	147
Amount of Education and Innovativeness	151
Testing Hypothesis Five	151
Discussion of the Findings	151
Professionalism and Innovativeness	154
Testing Hypothesis Six	154

CHAPTER	PAGE
Discussion	156
Cosmopoliteness and Innovativeness	159
Testing Hypothesis Seven	159
Discussion of the Findings	159
Opinion Leadership and Innovativeness	162
Testing Hypothesis Eight, Part A	162
Discussion of the Findings	162
Testing Hypothesis Eight, Part B	164
Related Findings	165
Norms on Innovativeness	169
Testing Hypothesis Nine	169
Discussion of the Findings	170
Regression Analyses	173
The First Regression Analysis	175
The Second Regression Analysis	177
The Third Regression Analysis	178
The Fourth Regression Analysis	178
Summary	180
VI. SUMMARY, CONCLUSIONS, FURTHER RESEARCH AND	
IMPLICATIONS	182
Summary	182
The Theory	182

CHAPTER	PAGE
The Problem	186
The Hypotheses	187
The Sample	187
Instrumentation	188
Related Literature	189
Collection of Data	189
Statistical Treatment	190
Results	190
Conclusions	191
Further Research	192
Implications	193
BIBLIOGRAPHY	195
APPENDIX A. Questionnaire A General Information ..	205
APPENDIX B. Questionnaire B Index of Cosmopolitaness.	209
APPENDIX C. Questionnaire C Role Attitudes of	
Principals	214
APPENDIX D. Role Attitudes of Teachers	217
APPENDIX E. Questionnaire D Self-Designating Opinion	
Leadership Questionnaire	220
APPENDIX F. Self-Designating Opinion Leadership Scale	222
APPENDIX G. Questionnaire E. The Differential Value	
Inventory	224

CHAPTER	PAGE
APPENDIX H. Questionnaire F. The Gough-Sanford Rigidity Scale	233
APPENDIX I. Questionnaire G. The Dogmatism Scale . . .	236
APPENDIX J. Questionnaire H. The Taylor Manifest Anxiety Scale	240
APPENDIX K. Interview Schedule	243
APPENDIX L. Data Sheet	260
APPENDIX M. Questionnaire Submitted to Three Officials of the Department of Elementary Education, Edmonton Public School Board	263
APPENDIX N. Supplementary Tables	265

LIST OF TABLES

TABLE		PAGE
I.	Distribution of Principals Adopting, Non-Adopting and Discontinuing Five Innovations	39
II.	Frequency Distribution of Number of Innovations Adopted by Principals in the Sample	40
III.	First Index of Innovativeness (I_1) Frequency Distribution of Scores on I_1 , by Schools in Sample.	40
IV.	Second Index of Innovativeness (I_2) Frequency Distribution of Scores on Each Innovation of I_2 and on I_2	44
V.	Intercorrelation Matrix of Various Ratings of the Socio-Economic Level of the Attendance Areas	120
VI.	Frequency Distributions of Numbers of Years of Total Teaching Experience, and Teaching Experience in Schools of the District of Principals in the Sample.	122
VII.	Frequency Distribution of Numbers of Years of Education Beyond Alberta Grade Twelve Recognized by the School District for Salary Purposes . .	124
VIII.	A Comparison of MAS Scores of High and Low Adopters (I_1)	131

TABLE	PAGE
IX. A Comparison of MAS Scores of High and Low Adopters (I_2)	131
X. A Comparison of MAS Scores in Two Studies . . .	133
XI. Distribution of Scores on the Taylor Manifest Anxiety Scale	134
XII. Variables Related to MAS Scores	135
XIII. A Comparison of the DVI Scores of High and Low Adopters (I_1)	137
XIV. A Comparison of the DVI Scores of High and Low Adopters (I_2)	137
XV. Distribution of Scores on the Differential Value Inventory	140
XVI. Variables Related to Traditionalism (DVI) . . .	141
XVII. A Comparison of Dogmatism Scores of High and Low Adopters (I_1)	142
XVIII. A Comparison of Dogmatism Scores of High and Low Adopters (I_2)	143
XIX. Distribution of Scores on the Dogmatism Scale .	145
XX. Variables Related to Dogmatism	146
XXI. A Comparison Between the Mental Rigidity Scores of the Principals in this Study and Those of a Sample of Superintendents	148

TABLE	PAGE
XXII. Distribution of Scores on the Gough-Sanford Rigidity Scale	149
XXIII. Variables Related to Mental Rigidity	150
XXIV. Education and Innovativeness	153
XXV. Amount of Education of Principals	154
XXVI. Variables Related to Amount of Education	155
XXVII. Distribution of Scores on the Role Attitudes of Principals	157
XXVIII. Variables Related to Professionalism	158
XXIX. Distribution of Scores on the Index of Cosmopoliteness	160
XXX. Variables Related to Cosmopoliteness	161
XXXI. Correlation Coefficients: Advice-Sought, Opinion Leadership, I_1 and I_2	163
XXXII. Distribution of Scores on the Self-Designating Opinion Leadership Questionnaire	167
XXXIII. Variables Related to Opinion Leadership	168
XXXIV. Norms on Innovativeness: Intercorrelations of the Scores of the Three Judges	170
XXXV. Norms on Innovativeness: Distribution of Ratings in Six Categories and Scores	171
XXXVI. Variables Related to Norms	172

TABLE	PAGE
XXXVII. Results of First Regression Analysis	176
XXXVIII. Results of Second Regression Analysis	177
XXXIX. Results of Third Regression Analysis	179
XL. Results of Fourth Regression Analysis	180
XLI. Correlation Coefficients of the Nine Predictors with Each Innovation and Each Index	266
XLII. Intercorrelation Matrix of All Variables Included in the Regression Analyses	267

LIST OF FIGURES

FIGURE	PAGE
1. Paradigm of the Adoption of an Innovation by an Individual Within A Social System . .	14 & 185

CHAPTER I

THE THEORETICAL FRAMEWORK

I. INTRODUCTION

Observers concede that our society is undergoing change at an unprecedented speed. Although educational change still tends to lag, it is generally admitted that the tempo of educational change is increasing and is likely to continue in this direction. This is the social background that made this study timely and pertinent to educational administration. The study focused on one of the key figures in the process of educational change, namely, the school principal.

Building principals are key figures in the process. Where they are both aware of and sympathetic toward innovation, it tends to prosper. Where they are ignorant of its existence, or apathetic if not hostile, it tends to remain outside the blood stream of the school.¹

¹Lee H. Demeter, "Accelerating the Local Use of Improved Educational Practices in School Systems," (Doctoral dissertation, Teachers College, Columbia University, 1944), quoted in Donald H. Ross (ed.) Administration for Adaptability, (New York: Metropolitan School Study Council, 1958), p. 71.

II. THE STATEMENT OF THE PROBLEM

Rogers² concludes his comprehensive study with a theory of diffusion and adoption of innovations. The central problem of this investigation which was concerned with Rogers' work was: Does Rogers' theory apply to the adoption of educational innovations? In more concrete terms, the problem may be stated in this fashion: which variables, considered to hold strong relationships with innovativeness by Rogers, account for most of the variance in principals' innovativeness? Which of these factors explain the variance in principals' innovativeness, anxiety, values, dogmatism, cosmopolitanism, mental rigidity, education, professionalism, opinion leadership, social system norms on innovativeness?

III. BACKGROUND OF THE STUDY

Rate of Change in Education

Mort³ and his followers have documented the slowness of change in education:

²Everett M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), pp. 300-316.

³Paul R. Mort, "Studies in Educational Innovation from the Institute of Administrative Research: an Overview," Innovation in Education, M.B. Miles (ed.), (New York: Bureau of Publications, Teachers College, Columbia University, 1964), p. 325.

The spread of an innovation through the American school system proceeds at a slow pace. This likewise must be measured in decades. It is very slow for a decade or so, very rapid for a couple of decades, and then very slow during the mopping-up period. Under extraordinary conditions, and with extraordinary expenditures of effort, the decades of invention and the decades of diffusion may be telescoped into months, as with the pre-flight aviation project.

Four explanations are usually given for this slowness of the diffusion and adoption of educational ideas as compared with innovations and ideas for agriculture and the medical drug industry.

The absence of scientific sources of innovation in education is one explanation.⁴ Drug laboratories and the vast network of agricultural experimental stations make possible accurate and precise measurements under controlled conditions for a given innovation. As Carlson puts it:

He (the county extension agent) is backed by very extensive and practical research, experiment, and development operations. He is in a much more favored position than is the school superintendent to judge the merits of the innovations he attempts to have adopted, and to demonstrate these merits to the acceptors. It is rare indeed when an educational innovation is backed by solid research. It is even rarer to find an

⁴G. Eichholz and E.M. Rogers, "Resistance to the Adoption of Audio-visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation," Miles, *op. cit.*, p. 315.

educational innovation which has been fully developed and subjected to careful trial and experimentation.⁵

The lack of change agents to promote new educational ideas is another explanation.⁶ No one in education actually fills a role similar to the agricultural county agent. Administrators tend to preserve the status quo.⁷

The lack of economic incentive to adopt is another explanation.⁸ As Pelley stated: "Unfortunately, there seems to be no possible profit motive in being an educational innovator."⁹ The results of an innovation in education are not so obvious as in agriculture or medicine; the increase in knowledge resulting from an innovation is not so evident and tangible as the increase in profits from a new seed or as the disappearance of a bodily ailment. Teachers and

⁵Richard O. Carlson, "Barriers to Change in Public Schools," Change Processes in the Public Schools, R.O. Carlson (ed.), (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 5.

⁶Eichholz and Rogers, loc. cit.

⁷Ibid.; R.O. Carlson, "Succession and Performance Among School Superintendents," Administrative Science Quarterly, 6:210-227, September, 1961.

⁸Eichholz and Rogers, loc. cit.

⁹J.H. Pelley, "Invention in Education," (unpublished Doctoral dissertation, Teachers College, Columbia University, 1948), pp. 170-171, quoted by Eichholz and Rogers, loc. cit.

administrators who innovate face added risks and difficulties, without any prospect of financial reward.

"Domestication" of public schools is given as a fourth reason. The public school belongs to that type of service organization where the clients are not free to reject the services provided. The public school cannot select its clients; on the other hand, the clients must accept the service where it is provided.¹⁰ The public school is not compelled to attend to all of the ordinary and usual needs of an organization. It has little competition from other organizations for clients; a steady clientele pool is assured. The existence of the organization is guaranteed. Thus change is not encouraged or often even condoned.

Acceleration in Change Rates

Sputnik was the catalyst that served to focus ongoing criticism of the American public school.¹¹ Moreover, since 1960, there has been a large-scale resurgence of concern with school subject matter.¹² There are indications that the rate

¹⁰Carlson, Change Processes in the Public Schools, p. 6.

¹¹L.A. Cremin, The Transformation of the School: Progressivism in American Education, 1876-1957, (New York: Knopf, 1961).

¹²Miles, "Educational Innovation: the Nature of the Problem," M.B. Miles, op. cit., p. 5.

of change in education is increasing.¹³ The millions of dollars that the United States Office of Education is pouring into education is likely to lead to more change.¹⁴ The increasing amount of research being done in education and the greater public pressure to improve educational practices have led to a greater emphasis on the diffusion and adoption of educational innovations. Until recently, little research had been done on the diffusion and adoption of educational innovations using the individual--superintendent, teacher or principal, as the unit of analysis. As recently as 1964, Miles¹⁵ could state:

This book was begun in the belief that we know far less than is desirable about the nature of educational innovation. Basically, the problem is that we do not understand --do not know with any clarity or precision the answers to questions about almost every imaginable aspect of innovation in education.

The situation does not seem to have changed much from 1962 to 1964. After reviewing over five hundred studies on the diffusion and adoption of innovations, including all those

¹³Ibid., p. 6.

¹⁴H.D. Gideonse, "The National Program of Educational Laboratories," Phi Delta Kappan, 47:130-133, November, 1965.

¹⁵Op. cit., p. 40.

reported by Ross,¹⁶ Everett Rogers¹⁷ could write:

The education diffusion tradition is one of the largest in number of studies (150 are listed in a recent bibliography by Ross, 1958), but this tradition is probably one of lesser significance in terms of its contributions to understandings of the diffusion of ideas. The education diffusion studies illustrate strong intercommunication within the tradition, but no close attention to any other diffusion tradition.

The present investigation was largely dependent on the rural sociology diffusion tradition which provided valuable data, research designs, and hypotheses to the new approach in research on the diffusion and adoption of educational innovations.

IV. THE IMPORTANCE OF THE STUDY

In the context of increasing rates of change and of the interdisciplinary approach to the study of problems in educational administration, this study into the theory of the adoption of innovations acquired unusual importance.

If education is going to keep pace with change in other spheres of life, it is essential that we understand the factors affecting change in our schools. Such factors as

¹⁶ Donald H. Ross (ed.), Administration for Adaptability, (New York: Metropolitan School Study Council, 1958).

¹⁷ Op. cit., p. 39.

personality, demography, and group norms have been found to affect the adoption of new practices in agriculture and medicine. Unfortunately, we know little of the influence of these factors in the educational setting. Certainly, every superintendent contemplating the introduction of new educational practices into his schools feels a need for guidelines as to what personality characteristics he should look for in an innovative principal; this study attempted to supply a partial answer to this need.

Given an increase in understanding, it seems likely that we may be able to manage educational innovation somewhat more skillfully than we have in the past.¹⁸

Unlike the studies done in the "Mort tradition" which dealt with school systems, this study focused on the individual as the unit of analysis; unlike Carlson's work,¹⁹ which dealt with superintendents, it focused on the school principal as an innovator.

¹⁸ Matthew M. Miles, "Educational Innovation: the Nature of the Problem," Miles, op. cit., p. 2.

¹⁹ Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965).

V. ROGERS' THEORY

Introduction

According to Rogers,²⁰ a general theory of the diffusion and adoption of innovations should be situated within a general theory of action. The adoption of a new idea by an individual can be conceptualized as a type of action. Parsons and Shils state:

The theory of action is a conceptual scheme for the analysis of the behavior of living organisms. It conceives of this behavior as oriented to the attainment of ends in situations by means of the normatively regulated expenditure of energy.²¹

Individuals are not isolated disconnected units but are interacting objects within social systems. Therefore, memberships in social systems have important effects of members' behavior.²² However, individuals do identify with groups to which they do not belong. These groups of "significant others" or reference groups may not be identical with the social system(s) to which an individual belongs. Thus some principals in this study admitted that they "took some

²⁰Op. cit., p. 301.

²¹Talcott Parsons and Edward A. Shils (eds.), Toward a General Theory of Action, (Cambridge, Mass.: Harvard University Press, 1959), p. 53.

²²Rogers, op. cit., p. 302.

of their cues" for the operation of their school from some professors in the Faculty of Education of the local university. These significant others influence the principal's behavior. The norms which arise from interaction within reference groups also influence the behavior of the actor.

Reference group theory attempts to explain the effects of belonging or not belonging to groups. Merton²³ summarizes the usefulness of reference group theory in these terms:

Reference group theory aims to systematize the determinants, and consequences of those processes of evaluation and self-appraisal in which the individual takes the values and standards of other individuals and groups as a comparative frame of reference.

Reference group theory recognizes the influence of man's membership in molding his attitudes and values, his perceptions and his ways of doing things. Sherif and Sherif²⁴ claim that ordinarily one's attitudes and loyalties are derived from the values, norms, and status regulations of his membership groups. Many authors now consider reference groups to be not only those groups to which the actor relates himself as a part but also those to which he aspires to

²³Robert K. Merton, Social Theory and Social Structure, (Glencoe, Ill.: The Free Press, 1957), p. 234.

²⁴M. Sherif and C.W. Sherif, An Outline of Social Psychology, (New York: Harper and Row, Publishers, 1956), p. 175.

relate himself for self-evaluation and attitude formation.²⁵

Sherif and Sherif also recognize the fact that actors necessarily use several groups as reference groups. Thus the principal of a school uses the teachers of his school, his fellow principals and perhaps administrators of the school system as some of his reference groups.

Out of the interaction of the individual actor with members of his reference groups arise a set of criteria which regulates the behavior of individual group members. These criteria, social norms, constitute "the most frequently occurring pattern of overt behavior for the members of a particular social system. Norms influence the diffusion of new ideas."²⁶ Norms may be a positive or a negative influence to change: they affect the innovative behavior of the members of a social system.

Now to relate social system and reference group theory to this study, let it be stated that all the respondents belong to a social system, which is taken to be the public school district within the city. All the respondents also belong to at least two sub-systems: each school constitutes

²⁵ Ibid., p. 167.

²⁶ Rogers, op. cit., p. 57.

a sub-system and all the principals in the employ of the school district constitutes another. The principals may also use several reference groups or "significant others" in developing their self-identity. Some principals identify with change agents to a greater degree than others. Others use more innovative principals or professors of the local university as reference groups. Although this investigation did not deal with reference group theory and with only some aspects of social systems, the study was done in the context of social system and reference group theory. In the same line of thought, perception is not one of the variables under study but mention must be made of it in the theoretical framework.

To adopt an innovation, the actor must exert energy to seek information, to try out the new idea, to evaluate it, and to adopt it. In evaluating and adopting, the actor must perceive the potential rewards and drawbacks of adoption. But perception is a function of the situational field.²⁷ However, a social system may embrace many different situational fields. The social system then, must be considered

²⁷ Situational field is defined as that part of the environment which is perceived as significant for the actor. It does not imply time boundaries as the term "situation" does. Rogers, op. cit., pp. 301-302.

in studying the diffusion and adoption of innovations.

The Paradigm

A modified version of Rogers' paradigm is included to clarify the relationship of one variable to another. (Figure 1)

The paradigm contains three major divisions: (1) antecedents, (2) process, (3) and results. "Antecedents are those factors present in the situation prior to the introduction of an innovation."²⁸ Antecedents are dichotomized into categories: (1) the actor's identity, or personal factors and (2) his perceptions of the situation or situational factors.

Personal factors. The actor's anxiety, his values, his dogmatism and mental rigidity, his education, his orientation towards his occupation, his cosmopolitaness and his opinion leadership are related to his innovativeness.

Situational factors. The actor's perception of the situation is related to his adoption behavior. The social system's norms on innovativeness, in this study the norms of each sub-system, i.e., each school within the district, serve as a stimulant or a barrier to innovativeness. There are

²⁸Ibid., p. 305.

PARADIGM OF THE ADOPTION OF AN INNOVATION BY AN INDIVIDUAL WITHIN A SOCIAL SYSTEM*



FIGURE 1

*Adapted from E.M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 306.

other incentives and restraints on innovativeness. Using innovativeness as a criterion for promotion may act as a stimulant to the introduction of new educational practices into the principal's school. If prestige in the school district is viewed as being attached to innovativeness, principals may tend to adopt new ideas more readily. The socioeconomic level of the attendance area of the school may serve as an incentive or a damper on the innovative behavior of the principal.

Actors are largely dependent on communication of information in the adoption process.²⁹ Innovators tend to become aware of innovations through mass media and cosmopolite³⁰ sources such as professional journals. At the evaluation stage the individual tends to rely on personal and localite communication to assess the characteristics of an innovation.

The adoption process ends in either adoption or rejection of the new idea. Adoption, which is by definition a decision to use the innovation on a continuous basis, may yet be discontinued at a later date.

This theory of adoption summarizes current research

²⁹Rogers, op. cit., p. 17, defines the adoption process as the mental process through which an individual passes from first hearing about an innovation to final adoption.

³⁰Cosmopoliteness is the degree to which an individual's orientation is external to a particular social system.

and theory in various fields of study. Rogers' theory is based on the research findings and the thinking of anthropologists, social psychologists, sociologists, (especially rural sociologists) and educators. The little research that has been done, using segments of Rogers' theory, is encouraging enough to warrant a more comprehensive test of the theory.

VI. THE PROCESS OF ADOPTION

Elements of Diffusion and Definition of Terms

Diffusion is the process by which an innovation spreads. It is the spread of a new idea from its source of invention to its ultimate users or adopters. Diffusion thus involves the dissemination or communication of an idea and culminates in adoption or rejection.³¹

Rogers³² isolates four crucial elements in the analysis of the diffusion of innovations: (1) the innovation, (2) its communication from one individual to another, (3) in a social system, (4) over time. This definition or description is similar to Katz, Levin, and Hamilton's definition. They define it as "(1) the acceptance, (2) over time, (3) of some

³¹Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 13.

³²Ibid., p. 12.

specific item --an idea or practice, (4) by individuals, groups or other adopting units, linked, (5) to specific channels of communication, (6) to a social structure, and (7) to a given system of values, or culture.³³

The Innovation. Innovation is one category of change. The term innovation connotes deliberateness, novelty, specificity and relative advantage over the existing situation.³⁴ Whether the innovation is objectively new or novel is irrelevant to the theory. An innovation is what is perceived as such by the individual. "An innovation is an idea or practice which departs from those generally prevailing among an aggregate of people who may be regarded as targets of directed change effort."³⁵

Communication. Diffusion has been defined as the process by which an innovation spreads. The diffusion

³³E. Katz, M.L. Levin and H. Hamilton, "Traditions of Research on the Diffusion of Innovations," American Sociological Review, 28:237-252, 1963.

³⁴Matthew B. Miles, "Educational Innovation: The Nature of the Problem," Innovation in Education, (New York: Bureau of Publications, Teachers College, Columbia University, 1964), p. 14.

³⁵Herbert F. Lionberger, "Diffusion of Innovations in Agricultural Research and in Schools," Robert R. Leeper (ed.), Strategy for Curriculum Change, (Washington, D.C.: Association for Supervision and Curriculum Development, 1965), p. 29.

process is the spread of a novelty from its source of origin to its adopters or users. At one level of thinking, the diffusion process may be viewed as constituted of three elements: (1) individual A, aware of an innovation, (2) the innovation and (3) individual B, who is unaware of the existence of the new idea. The inter-personal relationships between A and B will, consequently, influence the adoption or rejection of the innovation by individual B.

In a social system. Basically, a social system consists of a number of interrelated parts that together form a whole as a result of their interaction. Individuals constitute a social system. The social system investigated consisted of a school district. Each elementary school included in the sample constituted a sub-system of the school district. One school can be differentiated from another but all schools have a common goal and the people in each school interact. The principals also interact among themselves. The members of each sub-system influence the principal of their school and they, in turn, are affected by the principal. According to reference group theory, the norms that arise from the interaction of the members in each sub-system affect each member. The principal, however, has other reference groups in addition to his teachers. He also relates himself to all other

principals as a group and also relates himself to the central office administrators. The norms on innovativeness within each school may encourage or discourage the innovativeness of the principal independently of the principal's own tendencies and views of his super-ordinates in the bureaucracy and norms of the principals as a group.

Opinion leaders. Opinion leaders, influentials, gate-keepers or key communicators are the members of a social system who frequently tell many others about innovations. Opinion leaders are defined as "those individuals from whom others seek information and advice."³⁶ Some new ideas or innovations may be invented within the social system, the school district or within the sub-system, the individual school, but most likely a great number of the new ideas have their origin outside the school and outside the principal's social systems. In this case someone must introduce the innovation into the system and into the sub-system. Principals who oriented themselves outside their own school and outside their principal group were said to be cosmopolite. "Cosmopoliteness is the degree to which an individual's orientation is

³⁶ Rogers, op. cit., p. 16.

external to a particular social system."³⁷

Change agent. A change agent is a professional person who attempts to influence adoption decisions in a direction that he feels is desirable.

Time. "The adoption process is the mental process through which an individual passes from first hearing about an innovation to final adoption."³⁸ Going through the five stages of the adoption process necessarily involves time. Awareness, interest, evaluation, trial and adoption constitute the five stages of the adoption process. The adoption process deals with the adoption or continuous use of a new idea by an individual, person or social system, whereas the diffusion process involves the spread of the idea among other members of the social system or among social systems. The diffusion process comes to completion with the adoption of the idea by another member or by another system. A discontinuance is a decision to cease use of an innovation after previously adopting.³⁹ A discontinuance differs from rejection in that

³⁷ Ibid., p. 17.

³⁸ Ibid.

³⁹ Ibid., p. 19.

discontinuance means a stoppage in the use of an innovation. An adopter who discontinues the use of an idea, by definition, has gone through the five stages of the adoption process. A rejector never completed the adoption process.

Innovativeness. Innovativeness is the degree to which an individual is relatively earlier in adopting innovations or new ideas than the other members of his social system. "Relatively earlier" means earlier, in terms of actual time of adoption and not in terms of time as perceived by the adopter. Anthropologists conceive of innovativeness as the relative ease with which different cultures adopt novelties or new ideas. This meaning of innovativeness may not be very different from that given by sociologists, for early adopters are the members of a system who most readily adopt ideas.⁴⁰

Adopter categories. "Adopter categories are the classifications of individuals within a social system on the basis of innovativeness." The most used categorization seems to be that used by Rogers.⁴¹ He has used the terms:

⁴⁰H.G. Barnett, Innovation: The Basis of Cultural Change, (Toronto: McGraw-Hill Book Company, Inc., 1953), p. 57.

⁴¹Rogers, op. cit., p. 19.

innovators, early adopters, early majority, late majority, and laggards.

VII. RESEARCH TRADITIONS

Two main works attempt to outline the research traditions in the diffusion of innovations. A research tradition is a series of research studies on a similar topic in which successive studies are influenced by preceding investigations.⁴²

Katz, Levin and Hamilton⁴³ report seven major research traditions: (1) sociology, (2) early sociology, (3) anthropology, (4) market research, (5) mass communication, (6) rural sociology, and (7) technical assistance.

Rogers, on the other hand, examines six major diffusion traditions: (1) anthropology, (2) early sociology, (3) rural sociology, (4) education, (5) industrial and (6) medical sociology. Rogers leaves out marketing because very few research studies are available. He reviews five hundred and six diffusion studies; this compilation of studies is more comprehensive than Katz, Levin and Hamilton's.

⁴² Ibid., p. 22.

⁴³ E. Katz, M.L. Levin and H. Hamilton, "Traditions of Research on the Diffusion of Innovation," American Sociological Review, 28:237-252, 1963.

The Education Research Tradition.⁴⁴

As of 1958, the education research tradition numbered 150 studies.⁴⁵ However, in Rogers' view

...this tradition is probably of lesser significance in terms of its contribution to understandings of the diffusion of ideas. Strong intercommunication within the tradition has existed but until very recently little attention has been paid to other diffusion traditions.

Ross,⁴⁶ refers to Paul Mort as the "guiding force" in all the diffusion studies done in education. Mort's overriding purpose was to demonstrate the significance of local control of education to provide for schools adapted to the local situation. Mort defined adaptability as "the capacity of a school system to take on new and more appropriate educational practices and discard out-moded ones."⁴⁷ Adaptability is thus synonymous with innovativeness and is seen as a desirable quality of schools.

In the 150 studies that Ross reviews, the unit of

⁴⁴For a review of the literature in the other traditions, see Rogers, op. cit., p. 31ff., and Katz, Levin and Hamilton, op. cit.

⁴⁵Donald H. Ross, Administration for Adaptability, (New York: Metropolitan School Study Council, 1958), p. ix.

⁴⁶Ibid., p. xi.

⁴⁷Donald H. Ross, "Measuring Institutional Quality of School Systems," Teachers College Record, 57:172-177, December, 1955.

analysis was the school system. The central findings that have emerged from these studies and the fifty others completed by June 1961 may be summarized under the following headings:

1. Typically, there is a considerable time lag between the recognition of an educational need and the adoption of an innovation to fill the need. This period is a matter of decades.

2. The diffusion of educational innovations is also measured in terms of decades. The generalized adoption of an innovation takes the shape of an S-shaped curve. This curve, which typically extends over decades, can be telescoped into a period of months under emergency conditions where there is general support from government agencies.

3. The rate of diffusion of complex innovations is similar to that of simple ones; more costly innovations diffuse more slowly than others.

4. Innovative communities tend to be so in all areas of education.

5. Public attitudes toward education seem to lie at the core of willingness to spend more for schools and give teachers more freedom. This, in turn, contributes to innovativeness of the local schools by attracting innovative teachers.

6. Attitudes and expectations of the population

concerning the schools seem to be at the core of willingness to innovate or adapt to changing conditions. These attitudes and expectations, although related to education and occupation, can be altered. This seems the area most responsive to administrative action in bringing about change.⁴⁸

One valuable result of Mort's work has been the development of a "time scale."⁴⁹ This is an innovativeness scale made up of a number of new educational ideas. The scoring system gave early adopter school systems greater numerical credit for early adoption. This scale, which has been adopted by rural sociologists and researchers in other diffusion traditions, has led to improved measures of innovativeness.⁵⁰

A Convergence of Tradition

Recent research tends toward a convergence of diffusion traditions. This convergence is quite noticeable in the education tradition.

⁴⁸This summary is based on Rogers, op. cit., pp. 39-43, and on Mort, "Studies in Educational Innovation from the Institute of Administrative Research: an Overview," Innovation in Education, M.B. Miles (ed.), (New York: Bureau of Publications, Teachers College, Columbia University, 1964), pp. 317-328.

⁴⁹Rogers, op. cit., p. 41.

⁵⁰Loc. cit.

Thus Eichholz⁵¹ effected a convergence of the rural sociology tradition with the education tradition in his analysis of the rejection of audio-visual innovations. His unit of analysis was the teacher rather than the school system as usually found in the "Mort tradition."⁵²

Barton and Wilder's study of the diffusion of educational methods of teaching retarded children among school systems is another manifestation of converging traditions.⁵³

Carlson's work on the diffusion and adoption of team teaching, modern math, accelerated programs in secondary schools, foreign language instruction in elementary schools, language laboratories, and programmed instruction, is another marriage of education and sociology.⁵⁴ As with Eichholz and Rogers' study, Carlson's work contains a number of generalizations which seem to be applicable to rural sociological studies.

⁵¹ Rogers, op. cit., p. 42; G. Eichholz and E.M. Rogers, "Resistance to the Adoption of Audio-visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation," in M.B. Miles, op. cit., pp. 299-316.

⁵² Ibid., p. 302.

⁵³ Allen H. Barton and David E. Wilder, "Research and Practice in the Teaching of Reading: a Progress Report," in Miles, op. cit., pp. 361-398; Rogers, op. cit., pp. 42-43.

⁵⁴ Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965); Richard O. Carlson, "School Superintendents and the Adoption of Modern Math: A Social Structure Profile," in M.B. Miles, op. cit., pp. 329-342.

Haber's⁵⁵ work follows the new pattern. Although he made no explicit statement as to the sociological theories that he made use of, sociological theory has evidently influenced his work.

This investigation lay within this new practice of using the theories of the various research traditions to study problems in education.

VIII. ADOPTION AS A PROCESS

Rogers⁵⁶ has defined the adoption process as "the mental process through which an individual passes from first hearing about an innovation to final adoption." The adoption process is distinct from the diffusion process. The essential difference between the two processes is that the adoption process is an individual matter whereas the diffusion process occurs among persons or among social systems. The diffusion process is the spread of an idea from its creation to its ultimate users or adopters. A person adopts an innovation; an innovation spreads or diffuses among people or

⁵⁵ Ralph Norman Haber, "The Spread of an Innovation: High School Language Laboratories," The Journal of Experimental Education, 31:359-369, Summer, 1963.

⁵⁶ Op. cit., p. 76.

social systems.

Rogers,⁵⁷ considers the adoption process as one type of decision-making. As with the decision-making process, it can be broken down into stages for analytical purposes. Ryan and Gross,⁵⁸ in their classic study of the diffusion and adoption of hybrid seed corn among 259 Iowa farmers, were among the first to recognize the existence of stages in the adoption process. These two investigators distinguished between "awareness" of hybrid corn, "conviction" of its usefulness, trial "acceptance," and "complete adoption" of the seed.

Wilkening,⁵⁹ and other investigators also described the process of the adoption of an innovation as made up of steps. It is the result of a series of actions and thought decisions.

Beal and others,⁶⁰ and Copp and others,⁶¹ performed

⁵⁷Op. cit., p. 78.

⁵⁸Bryce Ryan and Neal C. Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," Rural Sociology, 8:15-24, 1943.

⁵⁹Eugene A. Wilkening, Acceptance of Improved Farm Practices, (Raleigh, North Carolina: North Carolina Agricultural Experiment Station Technical Bulletin, 98), quoted in Rogers, Op. cit., p. 80.

⁶⁰Beal and others, "The Validity of the Concept of Stages in the Adoption Process," Rural Sociology, 22:166-168, 1957.

⁶¹James H. Copp and others, "The Function of Information Sources in the Farm Practice Adoption Process," Rural Sociology, 23:146-157, 1958.

research primarily designed to determine whether the concept of a five-stage adoption process is empirically valid. Other writers have broken up the process into fewer or more stages but there is general agreement that the process is made up of stages.

The five stages.

The five stage conceptualization that Rogers used, seems well accepted in rural sociology⁶² and in education.⁶³

The awareness stage. At the awareness or exposure stage, the individual becomes cognizant of the innovation but is not in possession of complete information. The individual, at this stage, is not yet interested in the new idea. He is not motivated to seek further information. This view represents a passive conceptualization of the awareness stage; it is random or non-purposive. Other researchers, especially Hassinger,⁶⁴ have rejected the assumption that the individual cannot seek out new ideas. Mere information is insufficient

⁶²North Central Rural Sociology Committee, How Farm People Accept New Ideas, (Ames, Iowa: Cooperation Extension Service, Iowa State University, November, 1962).

⁶³G. Eichholz and E.M. Rogers, "Resistance to the Adoption of Audio-visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation," Miles, op. cit., pp. 299-316.

⁶⁴Edward Hassinger, "Stages in the Adoption Process," Rural Sociology, 24:52-53, 1959.

to create awareness. Rogers,⁶⁵ prefers the awareness-first view. He tentatively supports the view that awareness of a new idea creates a need for that information.

The interest stage. At this stage the individual wants to obtain more information about the innovation. The novelty has struck his imagination and he becomes interested in finding out of what value it can be to him. The individual becomes more involved psychologically. Having heard of a new method of teaching reading, a teacher wants to know more about it. He seeks information with a view of evaluating its usefulness to him. This stage may be compared to the data collection stage in research. Where he seeks the information, as well as how he interprets it, may well be affected by his personality and values and by the norms of his social system.⁶⁶ "Information" stage, "knowledge" stage, and "interest" stage, have been used synonymously.⁶⁷

The evaluation stage. At the evaluation stage, the individual mentally assesses the utility of the innovation to

⁶⁵Rogers, op. cit., p. 82.

⁶⁶S.A. Rahim, "The Diffusion and Adoption of Agricultural Practices: A Study in a Village in East Pakistan," (Comilla, Pakistan: Academy for Village Development, 1961), quoted in Rogers, op. cit., p. 83.

⁶⁷Loc. cit.

his personal situation and decides to try it out or reject it. The individual weighs the advantages and the disadvantages of the innovation and then decides whether to try it out or not. The innovation may well represent a threat to the security of the individual. Hence, he will seek personal information and advice from his peers to reinforce his decision to try out or reject the innovation. Thus before trying out a new method of teaching reading the teacher will likely ask colleagues for their opinion on the method. "Official" communication at this stage seems too general and may even be held suspect.

Application, acceptance, evaluation, application-decisions and convictions are other terms commonly used to refer to the evaluation stage.⁶⁸

The trial stage. At the evaluation stage, the individual has made the decision to reject or try out the innovation. At the trial stage the prospective adopter gives the innovation a "dry run" to see its applicability to his own situation. This may represent a way of overcoming the threat the innovation may pose to the prospective adopter. The individual is likely to seek out further information before using the new idea on a small scale. A trial reduces the

⁶⁸Rogers, op. cit., p. 84.

risks of change, whether they be financial, or psychological.

Ryan and Gross⁶⁹ found that most farmers insisted upon personal experimentation before adopting hybrid seed corn although community experience had shown its superiority. Even the laggards, the last ones to adopt, insisted on a trial. Rejection or adoption occurs after the trial stage.

The adoption stage. The adoption stage consists in deciding to make full use of the innovation. Thus a farmer has adopted hybrid corn when he uses it exclusively in all his fields or the teacher has tested the new method of teaching reading and decides to use it with all his students and on a continuous basis. Adoption implies continued use of the innovation in the future.

Discontinuances. "An innovation may be rejected at any stage in the adoption process. Rejection is a decision not to adopt an innovation."⁷⁰ This decision may be temporary, that is, the individual may later decide to adopt. A discontinuance, however, can occur only after the innovation has been adopted. "A discontinuance is a decision to cease use

⁶⁹Op. cit.

⁷⁰Rogers, op. cit., p. 88.

of an innovation after previously adopting."⁷¹

IX. OVERVIEW OF THE REPORT

Chapter One contained a statement of the problem and the theoretical framework of the study. Chapter Two deals with the dependent variable, innovativeness. A description of the construction of the instrument to measure innovativeness is included. Chapter Three is concerned with the independent variables. A description of each independent variable, of each instrument and a review of the literature on each variable constitute the major portion of this chapter. The hypotheses, assumptions, definitions, limitations and delimitations conclude Chapter Three. Chapter Four is devoted to the description of the sample and the collection of the data; a section on statistical treatment is included. Chapter Five presents the findings of the study. The last chapter contains the conclusions and implications of the study.

⁷¹Ibid., p. 89.

CHAPTER II

THE DEPENDENT VARIABLE

INTRODUCTION

An innovation is an idea or practice which departs from those generally prevailing among an aggregate of people who may be regarded as targets of directed change effort.¹ The five educational innovations under study were departmentalization in grades four, five and six, in all subjects other than physical education and music; the use of consultants put at the disposal of the schools by the school district; parent-teacher interviews held during school hours and involving the early dismissal of students; providing French instruction in grades five and six, and the regular use of television.

Innovativeness, the dependent variable in this study was defined as the number of educational innovations a principal had adopted from the five under consideration. Adoption of an innovation, here meant that the practice was used regularly in the school and not incidentally or occasionally.

¹Herbert F. Lionberger, "Diffusion of Innovations in Agricultural Research and in Schools," Robert R. Leeper (ed.), Strategy for Curriculum Change. (Washington: D.C.: Association for Supervision and Curriculum Development, 1965), p. 29.

The number of innovations adopted constitutes The First Index of Innovativeness (I_1). A Second Index of Innovativeness (I_2) used in this study was the extent of use made of each innovation. These five measures of extent were combined to constitute I_2 . The decision to produce two indices was based on the belief that the adoption of a number of innovations is a different type of behavior than is the adoption in depth of the innovations.

I. SELECTION OF THE INNOVATIONS²

The five innovations that constitute the Indices of Innovativeness were selected by the investigator from a list of approximately twenty supplied by the central office of the school district in which the study was made. The five innovations were chosen primarily in terms of their ease of investigation so that their acceptance could be readily discovered. There was evidence that all of the innovations were still in the process of diffusion and adoption. Although it was felt that all principals had the innovations available to them and that they were free to adopt or reject them, principals were

²For a list of criteria pertinent to the selection of innovations see Saxon Graham, "Class and Conservatism in the Adoption of Innovations," Human Relations, 9:91-100, 1956.

questioned as to the availability of the innovation and their freedom to innovate.³ All principals agreed that they could adopt all of the five innovations if they wanted to.

Several innovations were included in the Indices of Innovativeness in the light of Carlson's findings.⁴ He found that certain educational innovations correlated highly with one another but that this was not always the case.

Adoption performance on one innovation is not necessarily a reliable predictor of adoption performance on another innovation or several innovations.

II. THE FIRST INDEX OF INNOVATIVENESS (I_1)

This section is devoted to a description of the method of assessing adoption or non-adoption of each innovation.

Departmentalization

The Interview Schedule defined departmentalization as

³The central office staff of the district had assured the investigator that all the innovations under consideration were available to all the principals and that principals were free to adopt or to reject them.

⁴Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 53.

"meaning that one teacher teaches the same subject to more than one class in grades four, five, and six." Each principal was asked these questions:

Are you at present using departmentalization?

Yes _____ No _____

If Yes, in which subjects are you using it? How many teachers are teaching it to more than one class?

Principals who answered yes to the first question and used departmentalization in subjects other than music and physical education were said to have adopted departmentalization.

Subject Consultants

The use of subject consultants (visiting teachers) provided by the school district constituted the second innovation under consideration. Consultants visit their assigned schools as a matter of course. However, they will visit schools as often as required upon the principal's request. The use of subject consultants was considered an innovation in that it constituted a departure from the traditional practice of having the principal act as a consultant in all cases where his teachers require help.

Although half the principals reported that the teachers on their staff were the most common source of suggestions for the use of consultants, nevertheless, the principal still maintained control over most of the visits that

the consultants paid to the schools. It was felt, therefore, that calling upon the consultants was a reflection of the principal's willingness to depart from his traditional role of the principal and could be considered a mark of innovativeness on his part. However, this innovation was so widely diffused among the principals in the sample, that the discriminatory power of this innovation is subject to doubt. Only two of the thirty-six principals did not make regular use of consultants. See Table I for the distribution of principals adopting, non-adopting, and discontinuing the five innovations.

Parent-Teacher Interviews

This practice means the occasional provision of time for parents to meet teachers during normal school hours by dismissing classes earlier than usual.⁵

As Table I indicates, this innovation was not widely diffused in the schools of the district. In this study, only the number of occasions on which this practice was used in 1965-66 and 1964-65 was considered. A positive answer to the question: "Did you use this practice last year or this year?" gave the principal being interviewed a score of one on the First Index of Innovativeness. Sixteen principals had adopted

⁵Appendix K, Interview Schedule.

this practice; three had discontinued it; the rest had not adopted.

French Instruction

Nineteen principals reported the provision of French instruction in grades five and six. These are the two elementary grades where French may be provided. Seventeen of the thirty-six principals reported that no French instruction was being provided in grades five and six. No principal had discontinued French. Watching the French lessons on television was not included as providing French instruction unless this was part of a more comprehensive programme of French instruction. No principal reported that some classes watched the French lessons on television.

Television

Every school in the sample had at least one television set provided by the school district.

Twenty-nine principals declared that their school made regular use of the set(s) for instructional purposes. Three admitted that they had discontinued use and four said that the set(s) had never been used on a regular basis. Regular use was defined as watching every program of a series.

The First Index of Innovativeness (I_1) was devised by

assigning a score between a possible minimum of zero and a possible maximum of five to each principal. Each school could adopt none or any number of the five innovations under consideration. All schools had adopted at least two of the five innovations; some had adopted all five. Table II gives the distribution of these raw scores. The distribution is negatively skewed and has a mean of 3.61. Table III gives the distribution of these scores converted to a nine point scale described below.⁶ The mean on this distribution is 5.2.

TABLE I

DISTRIBUTION OF PRINCIPALS ADOPTING, NON-ADOPTING
AND DISCONTINUING FIVE INNOVATIONS
(N=36)

Innovation	Adoptions	Non-Adoptions	Discontinuances
1. Departmentalization	28	8	0
2. Consultants	34	2	0
3. Interviews	16	17	3
4. French Instruction	19	17	0
5. Television	29	4	3

⁶See section on Statistical Treatment in Chapter Four.

TABLE II

FREQUENCY DISTRIBUTION OF NUMBER OF
INNOVATIONS ADOPTED BY PRINCIPALS
IN THE SAMPLE
(N=36)

Number of Innovations Adopted	f
5	5
4	15
3	13
2	3
1	0
0	0
$\bar{X}=3.61$	

TABLE III

FIRST INDEX OF INNOVATIVENESS (I_1)
FREQUENCY DISTRIBUTION OF SCORES ON I_1
BY SCHOOLS IN SAMPLE
(N=36)

Scores	f
9	0
8	5
7	0
6	15
5	0
4	13
3	0
2	3
1	0
$\bar{X}=5.2$	

III. THE SECOND INDEX OF INNOVATIVENESS

The Second Index of Innovativeness (I_2) employed the same five innovations as I_1 , but was a measure of extent of use of the innovations. It was developed in an endeavor to determine which variables were significantly related to the extent to which the five innovations were adopted within the schools, and to ascertain whether these variables were the same as those associated with adoption of the five educational innovations.

The scores assigned to each principal on each innovation were added together, rank-ordered and then re-converted to scores using the method described in Chapter Four, Section IV. These scores constituted the Second Index of Innovativeness, a combined measure of extent of use of the five innovations. These scores which appear in Table IV ranged from two to eight; no principal scored one or nine.

Departmentalization

The percentage of extent of adoption of departmentalization was computed in the following fashion:

$$\frac{\text{Sum of numbers of teachers teaching the same subject to more than one class in Grades 4, 5 or 6}}{\text{number of Grades 4, 5 and 6 teachers}} \times 100$$

It was possible that percentages greater than 100 would be obtained by using this expression because some teachers were departmentalized in more than one subject. However, percentages greater than 100 were not obtained. The percentages obtained were rank-ordered and converted into scores ranging from one to nine; scores on Departmentalization ranged from three to nine. No one obtained one or two. Table IV gives the distribution of scores on each innovation and on I_2 .

This measure of extent needs refinement; it does not take into account the amount of time any one teacher spends in the departmentalized situation. A principal in whose school two teachers teach French to a total of four classes gets a higher percentage than the principal of a school where a single teacher teaches French to four classes.

Consultants

Two measures of extent of use were obtained. Each principal was asked to rate himself on a scale ranging from one (never) to six (always) in answer to this question:

How frequently have you asked for consultative help as compared with the number of times that you feel such help might have been of use?⁷

⁷Appendix K, Interview Schedule.

The scores thus obtained were converted using the nine-point scale described below. Table IV gives the distribution of these scores.

The second measure of extent was similar in that it was a measure of the extent of use in terms of perceived need. The assessment in this case was made by the Panel of Judges.⁸ Their three scores were added together and then converted using the nine point scale.

If we compare the scores the principals assigned themselves to the combined scores of the Panel of Judges, we find a correlation coefficient of .769 (Pearson "r", $p < .01$ for a two-tailed test). The principals' scores, converted to the nine point scale, are used throughout the report. These scores ranged from three to nine.

Parent-Teacher Interviews

Sixteen principals reported having dismissed classes earlier than usual in 1964-65 and/or 1965-66 to allow parents to meet the teachers during normal school hours. The actual number of occasions on which these interviews took place were rank-ordered and then converted to scores; these ranged from four to eight.

⁸ See Chapter Three, Section VII and Chapter Four, Section IV.

TABLE IV

SECOND INDEX OF INNOVATIVENESS (I_2)
 FREQUENCY DISTRIBUTION OF SCORES ON
 EACH INNOVATION OF I_2 AND ON I_2

Score on each Innovation	Innovation					Normalized Scores on I_2 (Total of Five I_2 Innovations)	f
	Depart'n	Consult- ants	Interviews	French	Television		
9	1	1	0	0	0	9	0
8	2	0	6	4	2	8	2
7	5	12	0	5	6	7	6
6	6	0	9	5	6	6	6
5	8	13	0	4	9	5	9
4	6	0	21	18	5	4	5
3	8	10	0	0	3	3	3
2	0	0	0	0	5	2	5
1	0	0	0	0	0	1	0
N =	36	36	36	36	36	36	36

As in the case of departmentalization, a more accurate measure of extent should be devised, taking into account the number of days over which the interviews extend and the size of the school. Providing one day, actually, part of an afternoon, for a school of five hundred students may indicate a degree of innovativeness different from that of providing five days for a school with the same enrolment.

French Instruction

Extent of adoption of French Instruction in grades five and six was calculated in the following fashion:

$$\frac{\text{Number of Grade 5 and 6 classes studying French}}{\text{Total number of Grade 5 and 6 classes.}} \times 100$$

This measure assumes that each school had available a sufficient number of French teachers to provide instruction in each grade five and six class. This assumption may not be warranted in each case.

The percentages obtained were rank-ordered and converted to scores which as Table IV indicates, ranged from four to eight.

Television

As indicated in a previous section, every school in the district was equipped with at least one television set.

Extent of use of television was assessed using the following formula:

$$\frac{\text{average number of hours of use of each set per week} \times \text{average number of classes viewing each week}}{\text{number of classes in the school}} \times 100$$

The very few schools whose measure of extent exceeded 100% were given the maximum arbitrarily decided upon, namely, 100%. The percentages were rank-ordered and converted to scores. The distribution of these scores ranged from two or eight.

This chapter dealt with the dependent variable, innovativeness. Two indices were developed to assess innovativeness. I_1 measured adoption of innovations; I_2 was a combined measure of the extent of use of the adopted innovations.

Chapter Three deals with the independent variables.

CHAPTER III

THE INDEPENDENT VARIABLES

I. THE CHOICE OF INDEPENDENT VARIABLES

Rogers¹ recommends four criteria in selecting independent variables to be used in a multiple correlation analysis.

1. Each independent variable should be highly related to the dependent variable, innovativeness.

2. Each independent variable should have a relatively low interrelationship with each other independent variable.

3. The total number of variables should be kept to a minimum to reduce computations and to increase practicality.

4. There should be a theoretical and practical relevance for the relationship of each independent variable with the dependent variable.

From a review of research studies which have attempted to predict innovativeness, Rogers developed his theory of the diffusion and adoption of innovations in which he incorporates a number of independent variables. Generally, in this study

¹E.M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 290.

an attempt was made to include all the independent variables which were thought to be applicable to the adoption of educational innovations. This chapter deals with each of the independent variables and the instrument chosen to measure each variable empirically.

II. ANXIETY

Review of the Literature

"Innovations are mostly resisted out of motives of self-interest and fear."² LaPiere³ also mentions fear of the unfamiliar as one of the intervening variables in the adoption of innovations:

Men always and everywhere accept with considerable complacence what is familiar to them, whatever it may be and however disagreeable it may seem to members of another, different society, apparently because almost anything familiar is less disturbing emotionally than is something unknown...what is designated as fear (or apprehension, dread, or the like) are those emotional disturbances that are induced by contemplation of or exposure to what is unknown or unfamiliar and hence unpredictable.

Social-psychologists also recognize fear or anxiety as one of the intervening variables in the acceptance of change.

²H.M. Kallen, "Innovation," Social Change, A. Etzioni and E. Etzioni, (New York: Basic Books Inc., 1964), pp. 427-436.

³R.T. LaPiere, Social Change, (Toronto: McGraw-Hill Book Company, 1964), p. 176.

Lippitt et. al.,⁴ for instance, list fear or anxiety among the most frequently noted sources of resistance to innovations:

- (1) Reluctance to admit weaknesses;
- (2) Fear of failure or awkwardness in trying to initiate a new practice or behavior pattern;
- (3) a fatalistic expectation of failure instilled by previous unsuccessful attempts to change, and
- (4) fear of losing some current satisfaction, are sources of resistance to change.

These authors go on to point out that group leaders may see a change or the adoption of an innovation as a threat to the stability of their roles. To overcome this resistance, some group workers have created social environments in which the prospective innovator, adopter of change, can feel safe in his attempts to try new modes of behavior. They assure the patient, the prospective innnovator that he is not playing "for keeps."⁵

Lippitt et. al., also discuss "anticipatory anxiety." According to these authors, individuals often hesitate to adopt an innovation because "they fear the consequences of altering stable procedures or patterns of behavior." They make the sweeping generalization that "almost everyone anticipates a negative rather than a positive response to any change

⁴R. Lippitt, J. Watson, B. Westley, Planned Change, (New York: Harcourt, Brace and Company, 1958), p. 180.

⁵Ibid., p. 205.

effort which impinges on other people who have not been directly involved in the change." From childhood experiences, we derive comfort from a familiar, predictable mode of existence.⁶ Fear of incompetence acts as a mediating force.⁷

To overcome resistance to change, sociologists and psychologists, taking fear or anxiety for granted, have developed techniques that usually incorporate discussion, participation, lessened-risk-taking.⁸ Miles,⁹ advocates the use of temporary systems as a means of "favoring innovativeness by diminishing the risks involved in innovations."

Other authors also allude to the need for security in adopting innovations.¹⁰

Personal security is another behavioral need for most people. It has many aspects. Acceptance in one's peer group is involved. Job security and tenure, as well as wages and salaries, are other important aspects.

Most studies of organizational change in business and industry have indicated that unhappiness about

⁶ Ibid., p. 204.

⁷ Ibid., p. 207.

⁸ L. Coch, J.R.P. French, Jr., "Overcoming Resistance to Change," Human Relations, 1:512-532, 1948.

⁹ Matthew B. Miles, "On Temporary Systems," Innovation in Education, M.B. Miles (ed.), (New York: Bureau of Publications Teachers College, Columbia University, 1964), pp. 437-490.

¹⁰ Ray Johns, Confronting Organizational Change, (New York: Association Press, 1963), p. 107.

inability to handle new work assignments or of losing the security of a congenial work group or a 'good' supervisor are as important as fear of losing one's job.

Although Rogers reports that there has been no attempt reported in the literature to relate a measure of anxiety to innovativeness, he includes this variable as one of the antecedents in the actor's identity which are related to the degree of innovativeness of the actor.

Bohlen,¹¹ generalizes that "innovators and early adopters tend to be more secure as individuals than late adopters and laggards." He also reports a high positive correlation between risk-taking, with relatively early adoption.

This study tested the validity of Bohlen's generalization, to the effect that anxiety is negatively related to innovativeness. His statement was accepted as an hypothesis to be tested in the educational context.

The Instrument

The terms security and anxiety have been used loosely in this report for evident reasons. A review of the literature shows that not only do various disciplines, such as anthropology, sociology and psychology, use the same terms to

¹¹J.M. Bohlen, "The Adoption and Diffusion of Ideas in Agriculture," Our Changing Rural Society, J.H. Copp (ed.), (Ames, Iowa: Iowa State University Press, 1964), p. 281.

refer to different concepts but also use different terms for apparently the same concept. Even within psychology itself, the terms anxiety and security are used to designate different concepts. Another difficulty is that anxiety is not a unitary concept.

Anxiety, stress, frustration, tension, emotional tension, neuroticism, arousability, fear, and threat are terms used synonymously by various authors to refer to the same concept or to variations of the same concept.¹²

This investigation used Holtzman's definition of anxiety which states that it is a "general trait or predisposition to respond in a characteristic way, rather than as a fluctuating condition or state that is largely situationally determined, it is often linked up with the terms neuroticism."¹³

The Manifest Anxiety Scale,¹⁴ a widely used instrument as a measure of anxiety,¹⁵ is built around the above definition of anxiety.

¹²A.F. Brown, "The Differential Effect of Stress-Inducing Supervision on Classroom Teaching Behavior," (unpublished Doctoral dissertation, University of Alberta, Edmonton, 1961), p. 54.

¹³W.H. Holtzman, "Personality Structure," Annual Review of Psychology, P.R. Farnsworth (ed.), (Palo Alto, Cal.: Annual Reviews, Inc., 1965), p. 145.

¹⁴J.A. Taylor, "A Personality Scale of Manifest Anxiety," Journal of Abnormal and Social Psychology, 48:285-290, 1953.

¹⁵Holtzman, op. cit., p. 146.

The Manifest Anxiety Scale (MAS) uses as its pool all Minnesota Multiphasic Personality Inventory (MMPI) items judged by clinicians as having relevance to anxiety. From a review of the various studies made using the MAS, Brown¹⁶ concludes that "it has been the most successful and most generally accepted anxiety scale."

A twenty-eight item version of the MAS, or A-scale, has been developed and frequently used in research.¹⁷ Brown reports that numerous studies have found the validity and reliability of the short form adequate for research and clinical uses. Reliability runs from the .70's to the .90's; validity with several criteria runs from the .50's to the .90's.¹⁸ A copy of the MAS is included in Appendix J.

III. VALUES

If we know what a society's culture is, including its particular system of values and attitudes, we can predict with a fairly high degree of probability whether the bulk of its members will welcome or resist a particular innovation.¹⁹

¹⁶Op. cit., p. 109.

¹⁷J.A. Taylor, op. cit.

¹⁸Op. cit., p. 110.

¹⁹Ralph Linton, "Cultural and Personality Factors Affecting Economic Growth," The Progress of Underdeveloped Areas, Bert F. Hoselitz (ed.), (Chicago: The University of Chicago Press, 1952), p. 74.

A Definition of Values

Several definitions of values have been put forth by anthropologists and sociologists. One definition that seems commonly accepted is C. Kluckhohn's. He defines value as

A conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means and ends of action.²⁰

This definition has the advantage of avoiding the pitfalls associated with relating values to norms and of differentiating between cultural values or group values and personal or individual values. "A personal value is the private form of a group value or of a universal value. It is not entirely unique to one personality but has its own special shadings, emphases, and interpretations."²¹ Kluckhohn goes on to state that,

Each people, it is true, has a distinctive set of values. However, no two individuals within the same society share identical values. Each individual adds a little here, subtracts a little there, makes this emphasis a bit stronger than most of his neighbors and makes that emphasis a little less strong....Indeed, the group value system is an abstraction, a statement of central tendencies in a range of concrete variation.²²

²⁰ Clyde Kluckhohn, "Values and Value-Orientations in the Theory of Action," Toward a General Theory of Action, Talcott Parsons and Edward A. Shils (eds.), (Cambridge, Mass.: Harvard University Press, 1959), p. 395.

²¹ Ibid., p. 416.

²² Loc. cit.

Anthropologists have provided hypotheses and general findings that have provided useful insights to sociologists in dealing with the acceptance of innovations.²³ It remained for sociologists, especially rural sociologists, to apply some of the broad hypotheses of anthropology to the study of specific innovations and to the social and psychological factors that intervene in the acceptance or rejection of innovations. Thus the idea of congruence or compatibility between the novelty and the traditional practice seems to have developed in anthropology but to have received great emphasis in rural sociology.²⁴ Thus Sibley concludes

...for planned changes to be successful they must be congruous with existing cultural beliefs (or at least, not in direct conflict with them) and must be presented in a manner which makes full use of existing social structural arrangements.²⁵

McCorkle,²⁶ explains the success of chiropractice in a

²³Joe M. Bohlen, "The Adoption and Diffusion of Ideas in Agriculture," Our Changing Rural Society: Perspectives and Trends, James H. Copp (ed.), (Ames, Iowa: Iowa State University Press, 1964), p. 267.

²⁴Rogers, op. cit., pp. 126-130.

²⁵Willis E. Sibley, "Social Structures and Planned Change: A Case Study from the Philippines," Human Organization, 19:209-211, Winter, 1960-61.

²⁶Thomas McCorkle, "Chiropractic: A Deviant Theory of Disease and Treatment in Contemporary Western Culture," Human Organization, 20:20-22, Spring, 1961.

mid-Western state in terms of congruence between values and the innovation.

Ideal Types

Theoreticians and researchers have found it useful to develop ideal types. Martindale,²⁷ defines ideal types as conceptualizations that are based on observations of reality and designed to institute comparisons. They do not necessarily exist empirically. Thus Weber's "bureaucracy" does not exist but it provides one extreme of a continuum against which it is practical to compare organizations which possess characteristics that the ideal type includes as a logical extreme. The function of ideal types is purely methodological. They provide tools for analysis and understanding of empirical study of characteristics of people and organizations.²⁸ Examples of ideal types include Merton's 'local and cosmopolite',²⁹ and Riesman's 'inner-directed and other-directed'

²⁷ Don Martindale, "Sociological Theory and the Ideal Type," Symposium on Sociological Theory, Llewellyn (ed.), (Evanston, Ill.: Row, Peterson, 1959), quoted in Rogers, op. cit., p. 60.

²⁸ Rogers, op. cit., p. 60.

²⁹ Robert K. Merton, Social Theory and Social Structure, (Glencoe, Ill.: The Free Press, 1957).

man.³⁰

Various criteria of the 'modern,' 'other-directed,' or 'technological man' have been used in research in the adoption of innovations.³¹ One typology or example of the traditional-modern continuum that offers some possibility is that provided by Riesman. Bowers, Brown, and Bryant, for instance, have hypothesized a positive relationship between other-direction and the acceptance of change.³²

The inner-directed man, according to Riesman, dominant in the nineteenth century but still surviving today has an internalized set of goals to which he has a long term commitment. He is equipped with an inner compass. The inner-directed man is technologically oriented; he thinks of work in terms of non-human objects; he is ambitious, individualistic and ruthlessly competitive.

The other-directed man, on the other hand, is sensitized to the expectations and preferences of others; he thinks of work in terms of human cooperation. He is imbued

³⁰David Riesman, Nathan Glazer, and Reuel Denney, The Lonely Crowd. (New Haven, Yale University Press, 1961).

³¹Rogers, op. cit., pp. 62-64.

³²R.V. Bowers, R.G. Brown, and C.D. Bryant, "Technological Change and the Organization Man: Preliminary Conceptualization of a Research Project," Sociological Inquiry, 32:117-127, Winter, 1962.

with the idea of fair-play and seeks the respect and affection of his peers. In Whyte's terms, the inner-directed man acts according to the Protestant Ethic, whereas the other-directed man lives according to the Social Ethic.³³ It is thus evident that these types might also be expected to perceive and to react to similar situations of technological change in markedly contrasting ways.³⁴

Review of the Literature

Linton and Sofer,³⁵ developed an inner-directed vs other-directed questionnaire "designed to evaluate the relative importance for a person of personal goals and standards as opposed to conformity and adaptation to the group." They found that the other-directed persons were more likely to change their opinions when presented with an authoritative statement contrary to their beliefs than inner-directed persons. If we can assume a high correlation between opinion change and innovativeness, we should expect other-directed

³³W.F. Whyte, Jr., The Organization Man, (New York: Simon and Schuster, 1956).

³⁴R.V. Bowers, et. al., op. cit.

³⁵Harriet Linton and Elaine Graham (Sofer), "Personality Correlates of Persuability," Personality and Persuability, C.I. Hovland and I.L. Janis (eds.), (New Haven: Yale University Press, 1959), p. 70.

persons to be more innovative.

Moreover, if as Riesman maintains, inner-directed people tend to be people of the past, one of van den Ban's findings would offer some support to the hypothesis of this study. He found progressive, innovative farmers "fairly well adopted to the present-day world. Less progressive farmers were adapted to circumstances of several decades back."³⁶

Fliegel,³⁷ found innovative farmers more favorable towards the use of credit than others. If the use of credit is a manifestation of present-time orientation, a facet of other-direction, we can deduce a positive relationship between other-direction and innovativeness. Himmelweit's study made a similar finding.³⁸ She found that even when class membership is held constant, different value orientations characterize early and late adopters. Early adopters were more present-oriented than late adopters who tended to be future-oriented.

Despite the lack of agreement as to what facets of

³⁶A.W. van den Ban, "Some Characteristics of Progressive Farmers in the Netherlands," Rural Sociology; 22:205-212, 1957.

³⁷F.C. Fliegel, "Traditionalism in the Farm Family and Technological Change," Rural Sociology, 27:70-76, 1962.

³⁸Hilda Himmelweit, et. al., Television and the Child, (London: Oxford University Press, 1958), p. 96.

modernism different studies measure, Rogers ³⁹ states that in "each of the research studies where an adequate measure of the traditional-modern dimension was available at the individual level, innovativeness of individuals is related to a modern rather than to a traditional orientation."

Using a questionnaire based on Riesman's typology, this investigation attempted to determine the relationship between inner-direction or traditionalism and innovativeness in education.

The Instrument

George Spindler, ⁴⁰ based his study on Riesman's hypothesis, that there is a shift in values from inner-direction to other-direction, and categorized values as "traditional" or "emergent." The traditional values are respectability, work-success ethic, individualism, achievement orientation and future-time orientation. The emergent values are sociability, relativistic moral attitude, consideration for others, hedonistic, present-time orientation and conformity to the group.

³⁹ Op. cit., p. 67.

⁴⁰ George D. Spindler, "Education in a Transforming American Culture," The Harvard Educational Review, 25:145-156, 1955.

J.W. Getzels,⁴¹ elaborated Spindler's rationale by further dividing values into major categories: the sacred and the secular. The sacred values, democracy, individualism, equality, and human perfectability, constitute the American creed of basic and undivorcible beliefs. These are the "things really worth fighting for."

In contrast to this basic set of unquestioned beliefs, the American secular or more mediate values are undergoing change.

1. Achievement is yielding to sociability.

2. Future-time orientation is being replaced by present-time orientation.

3. The traditional value of personal independence is being displaced by group conformity.

4. Finally, respectability and self-denial are yielding ground to relativistic moral attitudes without strong personal commitment.

This investigator accepted Riesman's hypothesis that inner-directed and other-directed people coexist in our society. This has been demonstrated by McPhee, Prince and

⁴¹J.W. Getzels, "Changing Values Challenge the Schools," The School Review, 65:92-102, Spring, 1957.

Abbott.⁴² Lupini also found significant differences in Montreal teachers along the traditional-emergent continuum.⁴³

To assess values along this continuum, this investigator made use of the Differential Value Inventory devised by Richard Prince at the Midwest Administration Center, University of Chicago.⁴⁴

This questionnaire (DVI) contains sixty-four forced-choice items representing eight categories related to the traditional and emergent conceptualization as presented by Getzels. The four continua are:

⁴²R.F. McPhee, "The Relationship Between Individual Values, Educational Viewpoints, and Local School Approval," (unpublished Doctoral dissertation, University of Chicago, 1959); Richard Prince, "A Study of the Relationships Between Individual Values and Administrative Effectiveness in the School Situation," (unpublished Doctoral dissertation, University of Chicago, 1957); Max G. Abbott, "Values and Value-Perceptions of School Superintendents and Board Members," (unpublished Doctoral dissertation, University of Chicago, 1960).

⁴³Dante Lupini, "A Study of the Relation of Differential Values to Social and Administrative Interactions," (unpublished Doctoral dissertation, University of Alberta, Edmonton, 1965).

⁴⁴Prince, op. cit. The questionnaire was used by permission of the author.

1. Firm moral commitment - - - - - Moral relativism
2. Individualism or independence- - - Conformity
3. Future-time orientation - - - - - Present-time
orientation
4. Work-success ethic - - - - - Sociability

Validity and reliability. The DVI has been used on a number of occasions, and appears to have an acceptable degree of construct validity. In the previously cited studies, it has tended to support the underlying theory.

Prince originally devised the instrument primarily for use on adolescents. He checked for validity and internal consistency by the Shanner method of item analysis. After three pre-tests, and after rejecting all items not able to stand the test, Prince used the instrument in his investigation. He found that the instrument discriminated among principals, teachers and students on the basis of pre-determined criteria.

McPhee⁴⁵ revised some items to improve its applicability with adult groups.

Abbott⁴⁶ performed an item analysis on McPhee's revised DVI. The nineteen items that failed to discriminate

⁴⁵Op. cit.

⁴⁶Op. cit.

at the desired level from 632 adult responses, were rewritten and tested with seventy-five adults. Another item analysis was made prior to accepting the instrument in its present form.

Lupini⁴⁷ used the DVI on a sample of eighty-one principals and 854 teachers in the Greater Montreal Area. He found the DVI applicable to his sample and to other similar samples from the Canadian population.

Scoring the DVI. Each traditional item that the respondent selects, adds one point to his score. In other words, the higher the score, the more traditional is the respondent. Theoretically, then, a person's score may range from zero, a most emergent score, to sixty-four, a most traditional score.

The Hypothesis

It was hypothesized that the most emergent principals would be more innovative as measured by the DVI and our two indices of Innovativeness.

⁴⁷Op. cit.

IV. DOGMATISM AND MENTAL RIGIDITY

Introduction

The rise to power of Hitler and Mussolini engendered much interest in the authoritarian character structure. Eric Fromm's Escape from Freedom,⁴⁸ A.H. Maslow's The Authoritarian Character Structure,⁴⁹ and The Authoritarian Personality by Adorno, Frenkel-Brunswick, Levinson and Sanford,⁵⁰ are but three extensive treatments of one facet of personality. From research on anti-Semitism, researchers studied the ideological content of anti-Semitism; they, then, devised methods for measuring anti-Semitism and studied the personality characteristics of anti-Semites.

From the study of Anti-Semitism, researchers went to ethnocentrism. From ethnocentrism, the tendency to reject and vilify outgroups, and at the same time overly accept and glorify the ingroup, interest went to the F-scale, published in 1950. The F (for fascism) scale was constructed with a two-fold purpose: (1) to measure prejudice without reference to any specific minority group and (2) to measure the underlying

⁴⁸ New York: Harper Brothers, 1950.

⁴⁹ Journal of Social Psychology, 18:401-411, 1943.

⁵⁰ New York: Harper Brothers, 1950.

personality dispositions toward a fascist view of life.

Strong correlations have been found between ethnocentrism, anti-Semitism, anti-Negro feelings, and political conservatism.⁵¹ The F scale and a number of validating studies were published in 1950 under the title The Authoritarian Personality. The title of the book has unfortunately led to an unwarranted generalization from "Fascist authoritarianism" to "general authoritarianism." As Shils points out, there is 'left' authoritarianism as well as 'right' authoritarianism.⁵² Rokeach carried this type of study one step further.

Rokeach's Work

Rokeach,⁵³ attempts to rectify the theoretical shortcoming of both Adorno et. al., and of Shils and attempts to study the properties of authoritarianism whether it be of the 'left' or of the 'right' type. "Instead, we should pursue a more theoretical ahistorical analysis of the properties held in common by all forms of authoritarianism regardless of

⁵¹ Milton Rokeach, The Open and Closed Mind, (New York: Basic Books, Inc., 1960), p. 12.

⁵² E.A. Shils, "Authoritarianism: 'Right' and 'Left'," Studies in the Scope and Method of the Authoritarian Personality, R. Christie and M. Jahoda (eds.), (Glencoe: The Free Press, 1954), pp. 24-49.

⁵³ Rokeach, op. cit., p. 14.

specific ideological, theological, philosophic, or scientific content."⁵⁴

Rokeach delineates the object of his study even further. He makes a distinction between the structures and the content of ideologies. He is not concerned as to what people believe but rather with the manner in which they hold beliefs.

From several studies that investigated the relation between social attitudes and cognitive functioning (thinking, memory, and perception), Rokeach discovered common factors in authoritarian and ethnocentric persons. These persons are more 'rigid' in their problem-solving behavior, more concrete in their thinking, and more narrow in their grasp of particular subject; they also have a greater tendency to premature closure in their perceptual processes and to distortions in memory, and a greater tendency to be intolerant of ambiguity.⁵⁵

Rokeach conceives of personality as being an organization of beliefs or expectancies having a definable and measurable structure.⁵⁶ Again, according to Rokeach, a belief is not necessarily what a person verbalizes: "We have to infer

⁵⁴Ibid., p. 16.

⁵⁵Loc. cit.

⁵⁶Ibid., p. 7.

what a person really believes from all the things he says and does."

Three Major Dimensions. Rokeach describes the belief system in terms of three major dimensions: a belief-disbelief dimension, a central-peripheral dimension and a time perspective dimension.

1. Belief-disbelief dimension. All the sets, beliefs, expectancies, or hypotheses, conscious or unconscious, that a person accepts as true of the world at a given time constitutes his belief system. His disbelief system comprises "a series of sub-systems rather than merely a single one, and contains all the disbeliefs, sets, expectancies, conscious and unconscious, that to one degree or another, a person at a given time rejects as false."⁵⁷

By system, Rokeach means psychological system in which the parts may be interrelated without necessarily being logically interrelated. A psychological system differs from a 'general system' in that the former contains a potentiality for 'functional interrelationship.' The psychological system includes "every belief and disbelief of every sort the person may have built up about the physical and social universe he

⁵⁷ Ibid., p. 33.

lives in. We mean it to represent each man's total framework for understanding his universe as best he can."⁵⁸

2. Central-peripheral dimension. The three levels or layers of organization of personality are the central, intermediate, and peripheral. The central region represents the person's 'primitive' beliefs, i.e., "some set of beliefs about the world he lives in, the validity of which he does not question and, in the ordinary course of events, is not prepared to question." These primitive beliefs have to do with the nature of physical reality, with the 'social world'-- whether this world is basically friendly or unfriendly - and with the self, i.e., about the way we orient ourselves in physical space, beliefs about autonomy, self-worth, etc.⁵⁹ The intermediate region represents the beliefs of a person in and about the nature of authority, authority being "any source to whom we look for information about the universe."⁶⁰ People differing in the degree of authoritarianism differ in the ideas they have about the nature of authority and the way to employ it as a "cognitive liaison system linking the person with the world."

⁵⁸ Ibid., p. 35.

⁵⁹ Ibid., pp. 40-41.

⁶⁰ Ibid., p. 43.

The peripheral area includes each and every (non-primitive) belief and disbelief derived from some authority, regardless of whether such beliefs are perceived consciously as being derived by the person himself.

3. Time-perspective dimension. The time perspective "refers to the person's beliefs about the past, present, and future and the manner in which they are related to each other."⁶¹ A broad time perspective is one in which the three orientations are included within the belief-disbelief system.

Open Systems. The more open the system, the more should the person consider the objective elements and the more he should resist irrelevant pressures. The open-minded person makes a clear distinction between the information and its source. These are the "defining characteristics of openness-closedness: degree of rejection of disbelief sub-systems, degree of differentiation of belief system as compared with disbelief system, and degree of differentiation within the disbelief system."⁶²

The relatively open person sees the world as more friendly. This type of person should be more impervious to

⁶¹ Ibid., p. 51.

⁶² Ibid., p. 62.

irrelevant pressures. The power of an authority depends on his "cognitive correctness, accuracy and consistency" with other information. Several sources of information will be used to test peripheral beliefs; thus closer interrelationship. Also the open-minded person evaluates the person separately from the beliefs the other person holds.⁶³

The more open-minded the person is, "the more the immediate future should be in the service of confirming predictions about the present." A narrow, future-oriented time orientation is a defining characteristic of closed systems.⁶⁴

The Dogmatism Scale. From the theory just outlined, Rokeach devised instruments to assess its fruitfulness.⁶⁵ He first devised the Dogmatism Scale "to measure individual differences in openness or closedness of belief systems." This scale serves to measure general authoritarianism and general intolerance.

The Dogmatism Scale went through five editions.⁶⁶ The final edition, Form E, contains forty items taken from

⁶³Ibid., p. 63.

⁶⁴Ibid., p. 64.

⁶⁵The Dogmatism Scale was used by permission of the author.

⁶⁶Rokeach, op. cit., p. 73.

Form D. An item analysis was performed to determine the forty elements that discriminated best.⁶⁷ For all statements, agreement is scored as closed, and disagreement as open. The total score on the Dogmatism Scale is the sum of scores obtained on all items. Respondents indicate disagreement or agreement with each item on a scale ranging from -3 to +3 with the zero point excluded in order to force responses toward disagreement or agreement. For scoring purposes, a constant of four is added to each item score. A 1-to-7 scale thus results. The reliabilities of Form E range from .68 to .93.^{68,69}

If persons can be placed along a continuum which extends from open- to closed-mindedness, can we expect this facet of personality to lead a closed-minded or dogmatic person to react differently to innovations from an open-minded person? Put more precisely, is there theoretical and empirical evidence to suggest that dogmatism is inversely related to innovativeness?

⁶⁷ Milton Rokeach, "Political and Religious Dogmatism: An Alternative to the Authoritarian Personality," Psychological Monograph, 70, No. 18 (Whole No. 425), 1956.

⁶⁸ Ibid., p. 89.

⁶⁹ For validation studies see M. Rokeach, The Open and Closed Mind, pp. 101-131.

Rokeach hypothesized a relationship in the same direction as the one stated in this study. "Our general hypothesis is that the more closed a person's belief system, as measured by the Dogmatism Scale, the more resistance he will put up to forming new belief systems."⁷⁰

Dogmatism and Mental Rigidity. After experimenting with the Doodlebug Problem, Rokeach and others have concluded that a distinction exists between rigid thinking and dogmatic thinking; the first refers to the resistance to change of single beliefs (or sets or habits), and the second refers to the resistance to change of systems of beliefs.

Thus, the referent of dogmatic thinking seems to be a cognitive configuration of ideas and beliefs organized into a relatively closed system; rigidity, on the other hand, points to difficulties in overcoming single sets or beliefs encountered in attacking, solving, or learning specific tasks or problems.⁷¹

Rokeach reports a number of experiments which support the hypothesized distinction between dogmatic and rigid thinking as measured by the Dogmatism Scale and the Gough-Sanford

⁷⁰Ibid., p. 181.

⁷¹Ibid., pp. 24, 25, 183.

Rigidity Scale.⁷² Summarizing a number of studies, Rokeach concludes that

...high scorers on the Dogmatism Scale are repeatedly found to differ from low scorers in the ability to synthesize new beliefs into a new system, but not in the ability to analyze or to break down single beliefs. These findings, as well as the converse of these for rigid versus non-rigid persons, provide empirical support for a distinction that has been previously sloughed off-the distinction between dogmatism and rigidity in thought and personality. Dogmatism is a system variable, a characteristic of the total system; rigidity is a characteristic of the elements within a system. Thus, in using the Dogmatism Scale to measure a total state of mind we are necessarily committed to study people's behavior vis-a-vis systems.⁷³

One variable that seems to account for the differences in the formation of new systems between open and closed persons in the extent to which one is willing to "play along" or to entertain new systems. Those with relatively open systems have been shown to be better off in this respect than those with relatively closed systems. Another related variable is past experience, which defines whether a particular system is, psychologically speaking, new or not new. A system is not new psychologically, if it can be shown to be rooted in specific past experience. The newer a system, the more will synthesis (related to dogmatism) be blocked. Also, the newer a

⁷²Ibid., p. 169ff.

⁷³Ibid., p. 286.

system, the more important is the role of individual differences in the capacity to entertain new systems.

Review of the Literature

It appears that little research has been done to find the relationship between a person's dogmatism and mental rigidity and innovativeness. Rogers,⁷⁴ reports one study where he found a negative correlation between Rokeach's dogmatism and innovativeness. The correlation was $-.15$. This is in the expected direction but is not statistically significant. Again using Rokeach's concept of mental rigidity, Rogers found a significant negative correlation between it and innovativeness.

Copp,⁷⁵ reports a highly significant relationship between his measure of rigidity and adoption. He obtained a highly significant correlation of $-.58$.

The Gough-Sanford Rigidity Scale

This scale is now included in the California Psychological Inventory, where it is labeled F_x (Flexibility). In

⁷⁴ Everett M. Rogers, "Personality Correlates of the Adoption of Technological Practices," Rural Sociology, 22:267-268, 1957.

⁷⁵ James H. Copp, "Personal and Social Factors Associated with the Adoption of Recommended Farm Practices Among Cattlemen," Kansas AES Tech. Bull. 83 (Manhattan, 1956), p. 26, quoted in Rogers, "Personality Correlates..."

the CPI, the items are scored in reverse order from that used in this investigation. In this investigation, a high score, i.e., a score which results from agreement with a great number of items, was an indication of a rigid person.

Low scorers (flexible, non-rigid persons) tend to be seen as "insightful, informal, adventurous, confident, humorous, rebellious, idealistic, assertive and egoistic; as being sarcastic and cynical; and as highly concerned with personal pleasure and diversion."⁷⁶

High scorers (rigid or non-flexible persons) tend to be seen as "deliberate, cautious, worrying, industrious, guarded, mannerly, methodical, and rigid; as being formal and pedantic in thought; and as being overly deferential to authority, custom, and tradition."⁷⁷

Flexibility is said to indicate the degree of flexibility and adaptability of a person's thinking and social behavior.

Reliability. Two reliability studies using the test-retest method are available. In one of these, two high school

⁷⁶The California Psychological Inventory Manual. (Palo Alto, California: Consulting Psychologists Press, Inc., 1960), p. 13. The F was reproduced by special permission from Consulting Psychologists Press, Inc.

⁷⁷Ibid.

junior classes took the CPI in the fall of 1952, and again a year later as seniors. In the other, two hundred male prisoners took the test twice with a lapse of from seven to twenty-one days between testings.

Test-Retest Correlations of the F_x Scale⁷⁸

High School Females	High School Males	Prison Males
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N = 125	N = 101	N = 200
.67	.60	.49

Validity. In an assessment a sample of forty University of California graduate students, F_x correlated $-.48$ with the staff's rating of "rigidity." In an assessment study of forty University of California medical school seniors, F_x correlated $-.36$ with the staff's rating of "rigidity." In a college class of one hundred and eighty students, F_x correlated $-.58$ with the California F (Authoritarian personality) scale.

The Hypotheses

From these considerations, the following hypotheses were formulated: (a) there is an inverse relationship between dogmatism as measured by the Dogmatism Scale and innovativeness; (b) there is an inverse relationship between mental rigidity as measured by the Gough-Sanford Rigidity Scale and innovativeness.

⁷⁸Ibid., p. 22.

Two separate relationships, namely, between dogmatism and innovativeness and between rigidity and innovativeness were posited for two reasons. The first reason is that dogmatism and mental rigidity have been shown to be two distinct psychological processes.⁷⁹ The second reason is that it was not known whether principals reject innovations as a result of an inability to analyze or break down single beliefs (found to be related to rigidity) or as a result of difficulty in substituting new belief systems at odds with a previously held belief system (found to be related to dogmatism).

V. SOCIAL STATUS

The Theoretical Background

Social status has been defined as "an indication of one's position in the social structure. It may either inhibit or enhance an individual's access to sources of information and his willingness to deviate from group norms."⁸⁰ This definition is consonant with Secord's, who defines status as "the worth of a person as estimated by a group or a class of persons. The estimate of worth is determined by the extent

⁷⁹Rokeach, op. cit., pp. 194-286.

⁸⁰E.M. Rogers, Diffusion of Innovations, p. 290.

to which his attributes or characteristics are perceived to contribute to the shared values and needs of the group or class of persons.⁸¹

What attributes or characteristics contribute to status depends upon the persons making the status evaluation. Furthermore, persons are accorded high status to the degree that their attributes are rewarding to group members. Characteristics that every one possesses in a given situation do not generally confer status, but only those attributes which are in scarce supply. "Similarly, high status is associated with the incurrence of relatively rare costs that contribute to the realization of the values of the group."⁸² To impute high status to principals with more years of academic and professional preparation seems reasonable. Ratsoy's study seems to warrant this hypothesis.⁸³ He found a positive relationship between the number of years of preparation and the level of occupational aspiration among prospective teachers. Moreover,

⁸¹Paul F. Secord, Carl W. Backman, Social Psychology, (Toronto: McGraw-Hill Book Company, 1964), p. 294.

⁸²Ibid., p. 297.

⁸³Eugene W. Ratsoy, "A Comparative and Cross-Sectional Study of Attitudes of Prospective Teachers," (unpublished Doctoral dissertation, University of Alberta, Edmonton, 1965), pp. 191-193.

he found that student teachers with more years of teacher education aspire to positions ranking higher on the Educational Profession Prestige Scale. Carlson,⁸⁴ used amount of education as one factor of his status variable among the superintendent's peers.

In an occupational group which is striving for 'professional status,'⁸⁵ a measure of professionalism is likely to reflect the status of a principal among his peers. Instead of asking principals to rank one another on 'professionalism,'⁸⁶ this investigation made use of a questionnaire which has been found to be highly discriminating among teachers. It was adapted for use with principals.

Review of the Literature

Social status has commonly been found to be positively related to innovativeness whether the measure of status be income, education, or size of farm operation.⁸⁷ Carlson,⁸⁸

⁸⁴ R.O. Carlson cited by M.B. Miles, op. cit., p. 335.

⁸⁵ Myron Lieberman, Education as a Profession, (Englewood Cliffs, N.J.: Prentice-Hall, 1958).

⁸⁶ See R.O. Carlson in Miles, op. cit., for a description of this method.

⁸⁷ Herbert I. Lionberger, Adoption of New Ideas and Practices, (Ames, Iowa: The Iowa State University Press, 1960), p. 84.

⁸⁸ R.O. Carlson, Adoption of Educational Innovations.

found a similar relationship among his superintendents. A direct relationship exists between a superintendent's position in the status structure and his rate of adoption of modern mathematics.⁸⁹

A word of caution must be introduced at this stage. Although a positive correlation exists between innovativeness and social status, social status can also act as a barrier to communication and hence to innovativeness.^{90,91} Although innovators tend to enjoy high social status, they may not enjoy the highest status in the community especially where norms are not favorable to substantial change. Lionberger and Coughenour report that farmers tend to seek advice from opinion leaders who are slightly above them in social status.⁹² Another variable related to status is the nature of the innovation. Graham,⁹³ found the upper class adopted canasta more rapidly; but the lower class adopted television more rapidly. Social class values seem to intervene.

⁸⁹R.O. Carlson, in Miles, op. cit., p. 338.

⁹⁰H.F. Lionberger, op. cit., p. 10.

⁹¹R.O. Carlson, Adoption of Education Innovations, p. 47.

⁹²Quoted in Rogers, op. cit., p. 242.

⁹³Saxon Graham, "Cultural Compatibility in the Adoption of Television," Social Forces, 33:166-170, 1954.

The Instruments

The General Questionnaire requested respondents to indicate their education as it has been evaluated for salary purposes. Thus all principals were placed in one of six categories. The number of each category represents the number of years of formal education beyond Alberta Grade Twelve recognized by the school district.

Professionalism was assessed through a questionnaire entitled The Role Attitudes of Principals. This is an adaptation of a questionnaire entitled The Role Attitudes of Teachers.⁹⁴ This, in turn, was first devised by R.G. Corwin,⁹⁵ to investigate conflict in school organizations. He developed a professional status role orientation scale to measure the individual's orientation to the teaching profession and its norms. From a review of the literature, Corwin and his staff selected a large number of items judged to be appropriate to this scale. Half of the items were retained as useful; these were examined by a panel of sociologists for relevance to several dimensions of the professional concept. In this way five categories were arrived at; these constituted five sub-scales

⁹⁴ Adapted with permission from Mr. N. Robinson.

⁹⁵ Ronald G. Corwin, The Development of An Instrument for Examining Staff Conflicts in the Public Schools, (Columbus, Ohio: Ohio State University, 1964).

of the professional scale. These, were later collapsed into four sub-scales: client orientation, orientation to the profession and professional colleagues' competence based on monopoly of knowledge, decision-making authority and control over work.

Robinson's adaption has been found useful in identifying differences in teacher professionalism between schools and between different levels of professional preparation.⁹⁶

The Role Attitudes of Principals is essentially the same as the Role Attitudes of Teachers. Modifications were made to adapt it to the principal's role.

Scoring the Role Attitudes of Principals. This instrument was scored in the same way as the Role Attitudes of Teachers. The respondent selected one out of five statements to complete each item. The five choices were: "strongly agree," "agree," "undecided," "disagree," "strongly disagree." The responses to each item were weighted from one to five. The direction in which responses were weighted depended upon the content of the item.

⁹⁶ Norman Robinson, Report on the Pilot Study Done in Connection with the Thesis Proposal, "Professional Role Orientations of Teachers and Principals and Their Relationships to Bureaucratic Characteristics of School Organization," University of Alberta, Department of Educational Administration, 1965.

The Hypotheses

Education, and professionalism, were hypothesized to be directly related to innovativeness.

VI. COSMOPOLITENESS

Theoretical Framework

Cosmopoliteness is the "degree to which an individual's orientation is external to a particular social system."⁹⁷ Information sources as well as individuals can be placed along the cosmopolite-localite dimension. Cosmopolite information about new ideas comes to the individual from outside the social system; local information comes to an individual within a social system from a member of the same system. Cosmopolite individuals are individuals who are oriented significantly to the outside world.⁹⁸ Merton distinguishes between social role and orientation.

Role refers to the manner in which the rights and duties inherent in a social position are put into practice; orientation refers to the theme underlying the complex of social roles performed by an individual. It is the theme (tacit or explicit) which finds expression in each of the complex of social roles in which the individual is implicated.⁹⁹

⁹⁷ Rogers, op. cit., p. 102.

⁹⁸ Robert K. Merton, Social Theory and Social Structure, (Glencoe, Illinois: The Free Press, 1957), p. 393.

⁹⁹ Ibid., p. 392.

According to Merton, the localite largely confines his interests to the community in which he lives; the local community constitutes his world. He tends to ignore the Great World; he is parochial.

On the other hand, the cosmopolite while still showing interest on his immediate community, is more interested in events taking place in the world at large. He is more likely to be interested in national and international politics than in local affairs. He is more mobile; he is likely to have lived in a number of communities. He is not rooted in the community.

Localites and cosmopolites differ in their interpersonal relationships, in the number and types of organizations they belong to and in the use of membership. They also differ in their patterns of influence. Localites tend to be sought out for their "intimate appreciation of intangible but affectively significant details."¹⁰⁰ Cosmopolites' advice is sought strictly as expert opinion. Expressions of these two views of the influentials are the 'medical specialist' versus 'the old family doctor,' the 'impersonal social welfare worker' versus the 'friendly precinct captain.'

¹⁰⁰ Ibid., p. 403.

The two orientations of localite and cosmopolite are also reflected in the newspapers and magazines they read and in the types of radio news commentators they listen to.

Apparently, working independently, Gouldner,¹⁰¹ Reisman,¹⁰² and Bentz,¹⁰³ arrived at the same conclusions as Merton.

Gouldner analyzes the constructs of cosmopolite and localite along three dimensions. His three dimensions are:

1. loyalty to the employing organization;
2. commitment to specialized or professional skills;
3. reference group orientations.

Cosmopolites present the following configuration.

They are low on loyalty to the employing organization, high on commitment to professional skills and are likely to use an outer reference group orientation. Localites are likely to be high on loyalty and low on commitment and have an inner reference group orientation.

¹⁰¹ Alvin W. Gouldner, "Cosmopolitans and Locals: Toward an Analysis of Latent Social Roles," The Administrative Science Quarterly, 2:281-306; 444-480, 1957-58.

¹⁰² Leonard Reisman, "A Study of Role Conceptions in Bureaucracy," Social Forces, 27:305-310, 1949, quoted in Gouldner.

¹⁰³ Vernon J. Bentz, "A Study of Leadership in a Liberal Arts College," (Columbus, Ohio: Ohio State University, 1950). (mimeographed), quoted in Gouldner.

Gouldner verified empirically the existence of these two identities in the context of a college and confirmed some of the predicted characteristics of the professors in the sample.

Although Merton and Gouldner worked in two different types of social systems, a community and a college, and used two different constructs of the localite and the cosmopolite, their two constructs are essentially the same and are likely applicable to principals in a school system.

Review of the Literature

Suthoff,¹⁰⁴ for example, worked with members of Parent-Teacher Association. Using Merton's construct he studied the participation of Parent-Teacher Association members in school affairs and found significant difference between cosmopolitaness and a number of variables. He found cosmopolites to have broader perspectives in education, to be interested in more youth groups, to have fresh ideas about educational practices and to be able to compare the local educational system with others. Cosmopolites judge the local system by state and national standards. They prefer innovations consonant with

¹⁰⁴ John Suthoff, "Local-Cosmopolitan Orientation and Participation in School Affairs," The Administrator's Notebook, 9:3, November, 1960.

educational development at the state and national levels.

Research in industrial sociology¹⁰⁵ reports a positive correlation between cosmopolitaness as indicated by the world-wide travel of executives, lack of secretiveness with plant visitors and innovativeness.

In medical sociology, Coleman and others,¹⁰⁶ have found a correlation between the innovativeness of doctors in using new drugs and their cosmopolitess, in this case, orientation toward the profession.

Ryan and Gross,¹⁰⁷ also reported a positive significant relationship between time of adoption of hybrid seed and the number of trips outside the locality of the adopters. Wilkening and others,¹⁰⁸ Beal and Rogers,¹⁰⁹ report findings that show a positive relationship between cosmopolitaness and

¹⁰⁵ Rogers, op. cit., p. 44.

¹⁰⁶ James Coleman and others, "The Diffusion of an Innovation," Sociometry, 20:253-270, 1957.

¹⁰⁷ Bryce Ryan and Neal C. Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," Rural Sociology, 8:15-24, 1943.

¹⁰⁸ E.A. Wilkening and others, "Use and Role of Information Sources among Dairy Farmers of Northern Victoria" (Paper presented at the Rural Sociological Society, University Park, Penn., 1960), quoted in Rogers, op. cit., p. 102.

¹⁰⁹ George M. Beal and Everett M. Rogers, "Informational Sources in the Adoption Process of New Fabrics," Journal of Home Economics, 49:630-634, quoted in Rogers, Diffusion of Innovations, p. 102.

innovativeness. Rogers and van Es have found a similar relationship in Colombian villages.¹¹⁰

The research done in the diffusion and adoption of educational innovations confirms findings made in other diffusion traditions.

Cocking,¹¹¹ found cosmopolite schools, located nearer to metropolitan centers, more innovative.

Eichholz and Rogers,¹¹² draw the generalization that "innovativeness varies directly with cosmopoliteness."

More recently still, Carlson¹¹³ found a positive relationship between the two variables in two samples of school superintendents.

The Instrument

Except for the last two items,¹¹⁴ the instrument used,

¹¹⁰ Everett M. Rogers and Johannis C. van Es. Opinion Leadership in Traditional and Modern Colombian Peasant Colombian Peasant Communities. (East Lansing, Michigan: Michigan State University, 1964), p. 48.

¹¹¹ Rogers, ibid., p. 62.

¹¹² Miles, op. cit., p. 313.

¹¹³ Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 49ff.

¹¹⁴ These two items are taken from John Suthoff's Local-Cosmopolitan Index. Used with permission of the author. John Suthoff, "Local-Cosmopolitan Orientation and Participation in School Affairs," The Administrator's Notebook, 9:3, November, 1960.

was designed expressly for this study by the investigator. Basically, the Index of Cosmopolitaness attempts to measure an individual's orientation as internal or external to a number of local social systems to which the individual belongs.

The Index of Cosmopolitaness includes twenty-one questions. Each of the questions attempts to assess the individual's orientation to the "outside" of Alberta, of the school district and of the city, as a community.

Many of the questions contained in the Index were put in as a result of their discriminating power in other studies, but considerable modifications were made in introducing these items into the Index. No tests of reliability nor of validity have been made of the items as they appear in the Index.

Scoring the Index of Cosmopolitaness

Items one, two, three, fourteen, fifteen, sixteen, and nineteen were scored in this fashion: the mean number of newspapers, magazines, journals, etc. was computed. Principals who ranked at the mean or above it were given a score of two on each item; principals who ranked below the mean were given a score of one on each item. A negative response to items four, five and eighteen gave a score of two; a positive answer, a score of one. A positive response to items six, seven, eight, nine, ten, eleven and seventeen gave a score of

two; a negative answer a score of one. The actual number given in items twelve and thirteen was used as the score. In question twenty, answering "local" gave a score of one; "outside," a score of two. In question twenty-one, answering in space one gave a score of two; space two, a score of one; space three, a score of three, and space four, a score of four. The scores on each item were summed up to yield a cosmopoliteness score.

The Hypothesis

It was hypothesized that more cosmopolite principals would be more innovative.

VII. OPINION LEADERSHIP

Theoretical Framework and Review of the Literature

The spread of new ideas takes place in a social network in which the act of adoption by an individual seems to influence others. Knowledge of a principal's involvement, of his interaction with other principals, of his influence, can explain in part his innovativeness.

Just as there are individual differences in innovativeness, so there are individual differences in the amount of influence a person exerts on the adoption decisions of others. Individuals who enjoy a greater share of influence

on the adoption decisions of other members of the social system are called opinion leaders. "Opinion leaders are defined as those individuals from whom others seek advice and information."¹¹⁵ Lewin has used the term 'gatekeeper' for the same person,¹¹⁶ Ross,¹¹⁷ has used 'sparkplugs;' 'information leaders,' 'adoption leaders,' and other appellations have been used for the same notion.¹¹⁸

The two-step flow of communication. The rejection of the view that prevailed in industrial sociology that the worker was an isolated individual working almost exclusively for material gains,¹¹⁹ did not seem to have spread to some other fields of sociology until Lazarsfeld and others,¹²⁰ studied the effect of mass media on voting behavior. Until

¹¹⁵ Everett M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 208.

¹¹⁶ Kurt Lewin, "Group Decisions And Social Change," Readings in Social Psychology, Guy E. Swanson and others (eds.), (New York: Holt, Rinehart and Winston, 1952), p. 459.

¹¹⁷ Donald H. Ross (ed.), Administration for Adaptability, (New York: Metropolitan School Study Council, 1958), p. 71.

¹¹⁸ See Rogers, op. cit., p. 209 for a list of synonyms.

¹¹⁹ F.J. Roethlisberger and W.J. Dickson, Management and the Worker, (Cambridge: Harvard University Press, 1956).

¹²⁰ Quoted in Rogers, op. cit., p. 151.

then the American public was viewed as a 'mass society' in which mass media communicated in a one-way fashion with individuals who communicated little with each other. The hypothesis first formulated in The People's Choice,¹²¹ that "ideas often flow from radio and print to the opinion leaders and from them to the less active sections of the population," has been since verified in other types of opinion leadership.¹²² Thus Menzel and Katz in their study of the epidemiology of a new drug confirmed the 'two-step flow of communication' hypothesis.¹²³

Journal reading plays a much larger role in the drug adoptions of doctors who receive one or more designations (sociometric choices) than among the isolates.

This conforms to the hypothesis of the 'two-step flow of communications,' which states, in essence, that messages originating outside of the individual's face-to-face group do not impinge on him directly, but are mediated by a few members of his group who expose themselves to messages from the

¹²¹ Paul F. Lazarsfeld and others, The People's Choice, (New York: Duell, Sloan, and Pearce, 1944).

¹²² Elihu Katz and Paul F. Lazarsfeld, Personal Influence, (Glencoe, Ill.: The Free Press, 1960), pp. 309-320.

¹²³ Herbert Menzel and Elihu Katz, "Social Relations and Innovation in the Medical Profession: The Epidemiology of a New Drug," Readings in Social Psychology, E.M. Maccoby, I.M. Newcomb, E.L. Hartley (eds.), (New York: Holt, Rinehart and Winston, Inc., 1958), pp. 536ff.

outside world more than their confreres. However, after a further analysis of their data, Menzel and Katz suggest revision of the model to allow for multistep flow of communication. This suggestion is in line with more recent research especially in rural sociology.¹²⁴ Innovators and early adopters use impersonal or mass media sources of information disproportionately and are capable of relying more on one-way communication channels to get information. Later adopters tend to rely more on personal sources and two-way communication in the adoption process.

This process then leads to a snow-ball effect, whereby the number of individuals adopting an innovation in each time period of the adoption process increases in proportion to the number of adopters. Rogers uses the term 'interaction effect'¹²⁵ to qualify the process "through which individuals in a social system who have adopted an innovation influence those who have not yet adopted." This, of course, is a specific type of diffusion.

¹²⁴Rogers, op. cit., p. 214 and Joe M. Bohlen, The Adoption and Diffusion of Ideas in Agriculture, " Our Changing Rural Society: Perspectives and Trends, James H. Copp (ed.), (Ames, Iowa: Iowa State University Press, 1964), p. 280.

¹²⁵Op. cit., p. 215.

Personal influence has been found to be an essential element in all types of decision-making, including adoption decisions. "Personal influence is defined as communication involving a direct face-to-face exchange between the communicator and the receiver, which results in changed behavior or attitudes on the part of the receiver."¹²⁶ Opinion leadership is a question of degree; it is not a trait which people either have or have not.¹²⁷ It must also be remembered that leadership is largely situational; what findings this investigation may make should be viewed as relevant to opinion leadership, and to opinion leadership as pertinent to innovations. Katz and Lazarsfeld have found that there tends to be little overlap in opinion leadership in different aspects of life.¹²⁸

Some characteristics of opinion leaders. Opinion leaders conform more closely to social system norms than the average member. Opinion leaders are slightly more innovative than their followers. Moreover, opinion leaders in a system with norms that discourage innovativeness are less innovative

¹²⁶Rogers, op. cit., p. 218.

¹²⁷Katz and Lazarsfeld, op. cit., p. 33, and Rogers, op. cit., p. 226.

¹²⁸Op. cit., pp. 97, 332-334.

than opinion leaders in groups which favor innovativeness.¹²⁹

With respect to sources of information, "opinion leaders use more impersonal, technically accurate and cosmopolite sources of information than do their followers."^{130,131} Opinion leaders make greater use of mass media; they seek more accurate sources of information than less influential members.^{132,133}

To be influential, opinion leaders must pass along their personal messages about innovations; thus the need for accessibility of opinion leaders. Accessibility is defined as the social and physical availability of an individual for social interaction.¹³⁴ Lionberger found opinion leaders to

¹²⁹C. Paul Marsh and A. Lee Coleman, "Farmers' Practice Adoption Rates in Relation to Adoption Rates of 'Leaders,' Rural Sociology, 19:180-181, 154.

¹³⁰Rogers, op. cit., p. 238.

¹³¹Everett M. Rogers, Characteristics of Agricultural Innovators and Other Adopter Categories, Research Bulletin 882, (Wooster, Ohio: Ohio Agricultural Experiment Station, 1961), pp. 1-2.

¹³²Everett M. Rogers and Rabel J. Burdge, Community Norms, Opinion Leadership, and Innovativeness Among Truck Growers, Research Bulletin 912, (Wooster, Ohio: Ohio Agricultural Station, 1962), pp. 11-13.

¹³³Everett M. Rogers and Rabel J. Burdge, Muck Vegetable Growers: Diffusion of Innovations Among Specialized Farmers, Research Circular 94, (Wooster, Ohio: Ohio Agricultural Experiment Station, 1961), p. 21.

¹³⁴Rogers, Diffusion of Innovations, p. 240.

have greater participation in formal organization.¹³⁵ Carlson found influential superintendents more involved in the social structure than isolates.¹³⁶ These and other findings reported in Rogers¹³⁷ seem to warrant the generalization that opinion leaders have more social participation than their followers.

If opinion leaders use more impersonal, technically accurate, and cosmopolite sources of information than their followers; if they have more direct contact with their followers and enjoy higher social status,¹³⁸ then it is likely that they adopt or reject new ideas before their followers. Available research indicates that they are more innovative than their followers.¹³⁹ This, of course, does not indicate that opinion leaders are necessarily more innovative than others. There are opinion leaders in every adopter

¹³⁵ Herbert F. Lionberger, "Some Characteristics of Farm Operators Sought as Sources of Farm Information in a Missouri Community," Rural Sociology, 18:327-338, 1953.

¹³⁶ Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965).

¹³⁷ E.M. Rogers, op. cit., p. 240ff

¹³⁸ Ibid., p. 243.

¹³⁹ Ibid., p. 242.

category.¹⁴⁰ As a matter of fact, some research indicates that not too great a gap must exist between two adopter categories for an influence relationship to exist. Each adopter category is mainly influenced by individuals of the same or of a slightly more innovative category.^{141,142,143} The social system norms on innovativeness seem to determine, at least in part, the innovativeness of opinion leaders.^{144,145,146}

In educational research, Carlson found a direct relationship between the number of friendship choices received by a superintendent from other superintendents and his rate of

¹⁴⁰Loc. cit.

¹⁴¹Rogers, op. cit., p. 244.

¹⁴²Rogers and Burdge, op. cit., 1961 and 1962.

¹⁴³Lionberger, op. cit.

¹⁴⁴Rogers, op. cit., p. 245.

¹⁴⁵Herbert Menzel, "Innovation, Integration, and Marginality: a Survey of Physicians," American Sociological Review, 25:704-713, 1960, p. 706.

¹⁴⁶Richard T. LaPiére, Social Change, (Toronto: McGraw-Hill Book Company, 1964), pp. 200-201.

acceptance of modern mathematics.¹⁴⁷

The Hypotheses

Opinion leaders are more cosmopolite than their followers.

Opinion leaders are more innovative than their followers.

The Instrument

A modified version of The Self-Designating Opinion Leadership Scale devised by Rogers,¹⁴⁸ was used to select the opinion leaders on innovativeness within the sample of principals. The Self-Designating Opinion Leadership Scale consists of six items. Rogers has found his scale to yield higher reliability than the two-item scale used in previous studies such as the one by Katz and Lazarsfeld.¹⁴⁹

¹⁴⁷The recognition of adoption distributions has led to the categorizing of farmers on the basis of the time when they adopt new practices. The finding that most adoption curves approximate a normal distribution has led to the use of standard deviations from the mean as a commonly accepted method categorizing farmers by time of adoption. Using this method farmers have been categorized and given functional names such as innovators, early adapters, early majority, majority, late majority and laggards. Bohlen, op. cit., p. 276. See Rogers, op. cit., pp. 148-192.

¹⁴⁸Op. cit., p. 230. Adapted with the author's permission.

¹⁴⁹Op. cit., p. 374.

"There is some evidence, according to Rogers, that the Scale measures a single dimension and does not overlap with other self-perceptions."¹⁵⁰ A Guttman scale analysis yielded a coefficient of reproducibility of 91.4 per cent.¹⁵¹

Rogers' scale has been modified for use with a sample of principals. There is no evidence at this stage that the modified version is as valid and reliable as Rogers' instrument.

Scoring the instrument. The modified version of Rogers' Scale called the Self-Designating Opinion Leadership Questionnaire was scored in the following fashion:

<u>Item Number</u>	<u>Correct answer</u>	<u>Score</u>
1.	yes	one point
2.	a	"
3.	a	"
4.	b	"
5.	a	"
6.	yes	"

Principals who scored high on this questionnaire constituted opinion leaders; those principals who scored low, followers. Opinion leaders are said to possess opinion leadership.

¹⁵⁰ Op. cit., p. 231.

¹⁵¹ Both versions are appended to this report.

VII. NORMS ON INNOVATIVENESS

The Theoretical Framework

For the purpose of this investigation the school district constituted the social system; the group of elementary school principals constituted a sub-system and the teachers and principal of each elementary school constituted another sub-system.

This investigation assumed that within each school, norms on innovativeness developed and influenced the innovativeness of the principal. Sherif and Sherif,¹⁵² explain that group structure which evolves over a period of time gives rise to a set of criteria which regulates the behavior of individual group members. These criteria, social norms, constitute the most frequently occurring patterns of overt behavior for the members of a particular social system.¹⁵³ A system's norms can be an incentive or a barrier to the adoption of new ideas. In this investigation norms on innovativeness were the type of social norms in question.

¹⁵² Muzafer Sherif and Carolyn Sherif, An Outline of Social Psychology, (New York: Harper and Row, Publishers, 1956), p. 175ff.

¹⁵³ Everett M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 57.

Review of the Literature

Van den Ban studied a sample of 903 farmers living in forty townships in Wisconsin.¹⁵⁴ The norms on innovativeness for each township were calculated by the average-innovativeness method.¹⁵⁵ The township norms on innovativeness were found to be the best predictor of individual innovativeness. The farmer's education, size of farm, and net worth were also found to be positively related to innovativeness. However, a farmer with all the characteristics of an innovative individual living in a township with low innovativeness norms adopted fewer innovations than a similar individual living in a township where the norms favored innovativeness.

In their investigation on Community Norms, Opinion Leadership and Innovativeness Among Truck Growers, Rogers and Burdge¹⁵⁶ measured the communities' norms on innovativeness by averaging the adoption-of-truck-crops-innovation scores of the farmers interviewed. The seven communities ranged from

¹⁵⁴ A.W. Van den Ban, "Locality Group Differences in the Adoption of New Farm Practices," Rural Sociology, 25:308-320, 1960.

¹⁵⁵ The various methods of assessing norms on innovativeness will be discussed below.

¹⁵⁶ Everett M. Rogers and Rabel J. Burdge, Community Norms, Opinion Leadership, and Innovativeness Among Truck Growers, Research Bulletin 912, (Wooster, Ohio: Ohio Agricultural Station, 1962).

5.15 (most innovative) to 3.83 (least innovative). A validity check on the community innovativeness norms was made by asking three professional workers who knew the area well to rank the seven communities on innovativeness. The three judges' rankings, although made independently, were highly consistent.¹⁵⁷ The judges' rankings of the seven communities on innovativeness were highly related to the community norms on innovativeness computed as an average of the adoption scores of the growers.¹⁵⁸ The community norms on innovativeness were found to account for twenty per cent of the variance in farmers' innovativeness scores. Size of operation, opinion leadership, communication behavior and social status explained another 44.1 per cent.

Similarly, Fliegel¹⁵⁹ found that attitudes toward new farm practices explained 11.43 per cent of the variance on innovativeness. Fliegel measured norms on innovativeness by obtaining expressions of favor or disfavor toward seven new

¹⁵⁷ Kendall's Coefficient of concordance was +.67, significant at the 0.05 level.

¹⁵⁸ Spearman rank order correlation between the judges' composite rankings and the norms on innovativeness is +.99, significant at the .01 level.

¹⁵⁹ Frederick C. Fliegel, "A Multiple Correlation Analysis of Factors Associated with Adoption of Farm Practices," Rural Sociology, 21:284-292, 1956.

practices other than the ones used to measure innovativeness.

In studies on the diffusion and adoption of educational innovations, not too much information seems to be available with respect to the norms on innovativeness. Mort,¹⁶⁰ however, in a re-analysis of the studies done at Columbia, reports indications that norms on innovativeness may be pertinent.

Where teachers were more highly trained and more accepting of modern educational practices (though community size and wealth appear to be the basic factors underlying these); where administrations provided active support for adaptations rather than remaining neutral; and where the public's attitudes favored modern practices... tended to be more adaptable or innovative systems.

After reviewing studies made in educational innovations, Rogers makes this statement:

The community's attitude about providing support for the school's costs is obviously an important intervening variable between community wealth and school innovativeness.¹⁶¹

¹⁶⁰Paul R. Mort, "Studies in Educational Innovation from the Institute of Administrative Research: An Overview," Innovation in Education, Matthew B. Miles (ed.), (New York: Bureau of Publications, Teachers College, Columbia University, 1964), pp. 317-328.

¹⁶¹Everett M. Rogers, "What Are Innovators Like?" Change Processes in the Public Schools, (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 60.

Reporting on the influence of fellow staff members, Willower and Jones found new teachers to be almost forced to adopt disciplinary procedures that they themselves did not approve.¹⁶²

On the stimulating influence of innovativeness norms, Carlson¹⁶³ found both samples of school superintendents positively influenced by group norms.

The Hypothesis

From the foregoing theory and research findings the following hypothesis was formulated:

Principals of schools where more innovative norms exist are more innovative than principals working in schools with less innovative norms.

Methods of Assessing Group Norms on Innovativeness

Three different approaches to measuring social system norms on innovativeness have been reported"¹⁶⁴

Averaging score. One method consists in averaging the

¹⁶²D.J. Willower, R.G. Jones, "When Pupil Control Becomes an Institutional Theme," Phi Delta Kappan, 45:107-109, November, 1963.

¹⁶³Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965), p. 55ff.

¹⁶⁴Rogers, Diffusion of Innovations, p. 68.

innovativeness scores of the members of a social system. This allows for comparison of one social system with another.

Attitude toward innovators. Another method is an attitude-toward-innovators type of measure. If the members of the social system view innovators favorably, the social system may be said to possess innovative norms.

Judges' ratings. A third measure of system norms is judges' ratings. The judges should be well acquainted with all the social systems under analysis and be able to rate them in terms of innovativeness norms.

Rogers and Burdige's study made use of the three methods with the same sample. The three methods yielded very similar results and suggest that almost any one of the three methods is equally valid.¹⁶⁵

Method Used in this Study

This investigation made use of the judges' ratings method to assess norms on innovativeness of each school in the sample. Using cards on each of which the name of one school appeared, three central office administrators of the school district were asked to rate all the schools in the sample in terms of innovativeness using this question:

¹⁶⁵Op. cit.

Consider that you wish to introduce new educational practices (innovations) into the elementary schools of the district. How would you rate the receptiveness to new practices of the schools whose names are on the cards? Sort the cards into six piles, considering the principal as being only one of the factors which affect the receptiveness of a school to new practices.

All schools in the sample were thus rated independently by three judges familiar with all of them. The ratings for each school were added together and then converted to scores.¹⁶⁶ A high score on norms on innovativeness was taken as high receptivity to educational innovations by the school.

VIII. THE HYPOTHESES

Following the theory outlined in the previous chapters the following hypotheses were formulated.

Hypothesis One

There is an inverse relationship between MAS scores and the innovativeness of the principal.

Hypothesis Two

An inverse relationship exists between DVI scores and the innovativeness of the principals.

¹⁶⁶ See below section entitled Statistical Treatment, Chapter Four.

Hypothesis Three

There is an inverse relationship between the dogmatism held by the principals and their innovativeness.

Hypothesis Four

The mental rigidity of the principals and their innovativeness are inversely related.

Hypothesis Five

A direct relationship between the amount of education of the principals and their innovativeness exists.

Hypothesis Six

The professionalism score of the principals and their innovativeness were hypothesized to be directly related.

Hypothesis Seven

It was hypothesized that the cosmopolitaness and the innovativeness of the principals were directly related.

Hypothesis Eight, Part A

Opinion leadership and innovativeness of the principals were hypothesized to be directly related.

Hypothesis Eight, Part B. A direct relationship between the opinion leadership and the cosmopolitaness of the principals was hypothesized.

Hypothesis Nine

A positive relationship between norms on innovativeness of the school and the innovativeness of the principal was hypothesized.

IX. OPERATIONAL DEFINITIONS

Anxiety

Anxiety was the score made on the Taylor Manifest Anxiety Scale.

Values

The principals' scores on the Differential Value Inventory.

Dogmatism

Dogmatism was the score made on Rokeach's Dogmatism Scale.

Mental Rigidity

Mental rigidity referred to the score made on the Gough-Sanford Rigidity Scale.

Education

The amount of education of the principal used in this study was the number of years that the school district

recognizes for salary purposes. The six categories used correspond directly to the six salary categories based on years of formal education beyond Alberta grade twelve. All thirty-six principals in this study were thus grouped into six educational categories.

Professionalism

Respondents' scores on the Role Attitudes of Principals.

Cosmopolitaness

Cosmopolitaness referred to the scores made on the Index of Cosmopolitaness.

Opinion Leadership

The scores obtained on the Self-Designating Opinion Leadership Questionnaire.

Social System Norms on Innovativeness

Scores based on the ratings assigned to schools by the Panel of Judges on receptivity to new educational practices.

Innovativeness

Innovativeness is the dependent variable. Two measures of innovativeness were used. The first, called the First Index of Innovativeness, was made up of five innovations.

Scores were computed on the basis of the number of innovations adopted from the five included in the Index (I_1). The second measure, called the Second Index of Innovativeness (I_2), was made up of the same five innovations. In this case, scores were computed on the basis of the extent of adoption of the five innovations.

X. LIMITATIONS, ASSUMPTIONS AND DELIMITATIONS

Limitations

The present study did not pretend to test every hypothesis that Rogers' theory of the diffusion and adoption of innovations suggests. Thus the characteristics of the innovation were not part of this study. However, the major limitation of this study was probably that it did not attempt to categorize principals into innovators, early adopters, early majority, late majority, and laggards and to test the validity of the time curve.¹⁶⁷

Another limitation was that no account was taken of the differential organizational pressures that may exist on the various principals and schools under the jurisdiction of the school board in the district or of the community that the

¹⁶⁷ Rogers, op. cit., pp. 121-124; 148-192.

school serves.

Other limitations concerned the instruments because they did not attempt to measure all concepts comprehensively. The Differential Value Inventory does not tap all values; the Index of Cosmopolitaness does not measure all facets of cosmopolitaness; the Index of Innovativeness does not include all educational innovations available to the principals who took part in the study.

The size of the sample, thirty-six, represents another limitation. The criteria for the selection of the sample are set out as a delimitation of the study. The study was restricted to principals.

The last limitation is inherent in the assumptions made in using linear correlation statistics. Correlations will appear only when the linear-regression model is a good fit to the data. Consequently, it is possible that further statistical analysis might reveal relationships of a curvilinear nature which do not appear in this study.

Assumptions

1. The instruments were assumed to possess a degree of validity and reliability suitable for the present study.
2. It was assumed that the principals in the sample possessed the required knowledge to complete the instrument.

3. It was assumed that principals are key figures in the adoption of innovations in schools.

4. It was assumed that continued use by a principal of an innovation introduced by his predecessor(s) was a manifestation of innovativeness on the part of the successor.

5. It was assumed that the sample drawn represented the population of principals, working in similar schools in this school district.

Delimitations

Only thirty-six elementary school principals of a single school district in a large Western Canadian city who devoted a minimum of seventy per cent of their time to administration were selected. Principals of combined elementary-junior high schools where junior high classes constituted more than twenty per cent of the total number of classes in the school were not included. All principals had to be in at least their second consecutive year as principal of their present school. This study concentrated on the personal characteristics of the principals which were thought to be related to the adoption of educational innovations.

CHAPTER IV

DATA SOURCES, COLLECTION AND TREATMENT

This chapter contains an explanation of the methods used to select the sample, a description of the procedures used to collect the data and the classification of responses. It also includes a description of the respondents and an explanation of the statistical treatments used.

I. SELECTION OF THE SAMPLE

Because practices which would be classified as innovations in the elementary schools are not necessarily innovations in secondary schools, it was decided to restrict the population under investigation to elementary schools within one urban school district. This procedure yielded a sufficiently large and uniform population, and reduced the number of uncontrollable factors. The small number of secondary schools which existed within the school district precluded the possibility of an investigation at the secondary level.

The inclusion of the Separate elementary schools within the same geographical area into the sample would have increased its size but would have raised questions as to the validity of considering all these schools, Public and Separate,

to be from the same population. Although both school systems serve the same geographical area and operate under the School Act, practices differ. The Separate schools, for instance, provided French instruction from grades lower than five and had their own lessons on television.

Not all Public elementary schools were included in the sample. The criteria for including the schools were as follows: (1) The school had to contain a minimum of twelve elementary classrooms. This insured that the principal under the regulations of the district devoted at least seventy per cent of his time to the administration of the school. This percentage of time free from teaching duties was considered to offer greater opportunity for consideration of the adoption of educational innovations by the principal. (2) The principal had to be in at least his second consecutive year of office in that school. This requirement should mean that opportunity had occurred for the principal to have become sufficiently familiar with the school and his position to introduce innovations or influence other innovations. (3) The number of junior high school classrooms was not to exceed twenty per cent of the total number of classrooms. This, it was expected, would minimize whatever effect the junior high school section might have on the elementary grades in terms

of the principal's major involvement.

Pre-testing of the instruments was performed by using the three demonstration or laboratory schools of the district. This preliminary study proved useful in clarifying some items on the instruments. These three principals were excluded from the main sample because it was felt that the assumption could not be made that these were typical principals.

Thirty-nine schools thus met the criteria. However, one principal of these schools refused to take part in the study; a second refused to answer too many important questions to be included in the sample, and a third was unable to participate because of recent illness. Thirty-six principals in thirty-six elementary schools, thus, constituted the sample.

II. COLLECTION OF THE DATA

The data were obtained by three methods: interview, questionnaires, and documental records.

Completion of Questionnaires

The principals included in the sample were called to a meeting by a member of the central office of the school district. At this meeting, the investigator explained the purpose and methods of the study. The principals completed questionnaires A and B, that is, The General Information

Questionnaire and the Index of Cosmopolitaness. After completing these two questionnaires, the respondents handed them to the investigator who gave the respondents an envelope containing questionnaires C, D, E, F, G, and H, to be completed at home. Thus cosmopolitaness, professionalism, opinion leadership, values, mental rigidity, dogmatism, and anxiety are the variables that were collected by means of questionnaires. Certain demographic data were requested in Questionnaire A. All instruments are appended to this report.

Interviews

Within the next two weeks all the principals were interviewed by the investigators. The interviews lasted from forty-five minutes to two hours. On this occasion, the investigators collected the questionnaires that the respondents had taken home with them from the meeting. The interview was used to collect data primarily concerned with the dependent variable, innovativeness. Not all data collected through the instruments appended to this report were used in this investigation; this study is part of a larger one. The two other studies used the same dependent variable and a sample of forty

instead of the present thirty-six.¹

Other data were obtained from members of the central office of the school district. Three members of this office, supervisors familiar with all the schools, formed a panel and rated the schools with respect to norms on innovativeness.²

This same Panel of Judges also supplied the investigator with ratings on the use that each principal made of the consultants or visiting teachers that are at the disposal of the principals.³

Socio-Economic Level

Although no relationship was hypothesized between the socio-economic level of the attendance area of each school and innovativeness, the coefficient of correlation is included in Table XLII because it was used in two regression analyses. The data involved in this variable were obtained from the

¹Three principals were excluded from the sample used in this study because their schools did not meet the established criteria as to size. The fourth principal was dropped from the sample because he failed to supply information essential to this study. Otherwise, the sample in this study is the same as that of the other two.

²See Chapter Three, Section VII for an explanation of norms.

³See Sections on Consultants in Chapter Two and on Statistical Treatment in this Chapter.

planning officers of the school district and of the city. Three measures constituted the socio-economic level used in this study. The first measure was the mean value of houses sold in the attendance area of each school since 1963. These values ranged from \$9,189 to \$19,199, according to the figures supplied by the assessment office of the city. The mean value of houses in any one attendance area fluctuates somewhat, especially in areas under rapid development. The mean values were partitioned in nine categories in an effort to normalize the distribution of mean values. This technique is described in Section IV of the present chapter. The second measure was obtained from the planning officer of the city. He was asked to place the thirty-six schools into nine categories, but no restriction on the number of schools which was to be placed in each category was mentioned-- this was left to the discretion of the officer. The third measure of socio-economic level was very much like the second; the planning officer of the school district was asked to use the same procedure as the planning officer of the city. In order to produce an overall socio-economic index of each school attendance area, the three assessments were added, and the sums forced into an approximately normal distribution. Although this procedure assumes that the socio-economic assessments can be treated as

scores, the writer considers that this may be justified in view of the subjective nature of assigned socio-economic status to a residential area and in view of the significant correlations indicated in Table V.

TABLE V

INTERCORRELATION MATRIX OF VARIOUS RATINGS OF THE
SOCIO-ECONOMIC LEVEL OF THE ATTENDANCE AREAS
(N=36)

	1	2	3	4
1. House value	1.000	.760	.595	.856
2. School Planner		1.000	.671	.894
3. City Planner			1.000	.840
4. Combined Measure				1.000

All coefficients are significant at the .005 level for a one-tailed test.

Examination of Records

Some information such as the enrollment per school, and other data, indicated in the Data Sheet appended to this report were obtained from the records of the school district.

III. CHARACTERISTICS OF THE RESPONDENTS AND OF THE SCHOOLS

The Respondents

Some consideration will now be given to characteristics of the respondents, although no comparisons are made to

show that the thirty-six principals were representative of any larger group.

All thirty-six principals in the sample were male, aged from thirty-four to sixty-three. The mean age was 49.2 years; the standard deviation, 7.3 years.

Principals in the larger schools were exempt from all teaching duties; fourteen respondents fell in this category. The other twenty-two respondents taught from one hour per week to sixteen; the number of teaching hours of the principals was inversely related to the size of the school. The mean number of hours of teaching per week was 3.9 with a standard deviation of 5.6 hours.

Table VI gives the frequency distribution of the total number of years of teaching experience (classroom and administrative experience) of the principals in the sample. The mean was 26.5 years; the standard deviation, 8.3 years. Total teaching experience ranged from nine years to forty-four years. The same table gives the frequency distribution of the number of years of teaching experience (classroom and administrative experience) of the principals with the present school district. Principals had been teaching in the local school district from six to twenty-eight years. The mean was 17.7 years; the standard deviation, 5.6 years.

TABLE VI

FREQUENCY DISTRIBUTIONS OF NUMBERS OF YEARS OF TOTAL TEACHING EXPERIENCE, AND
TEACHING EXPERIENCE IN SCHOOLS OF THE DISTRICT,
OF PRINCIPALS OF SCHOOLS IN SAMPLE^a
(N=36)

Number of Years of Teaching Experience ^b		Number of Years of Teaching Experience in Schools of the District ^b	
Range in Years	f	Range in Years	f
41 and over	1	28 and over	3
37 - 40	4	25 - 27	2
33 - 36	5	22 - 24	5
29 - 32	5	19 - 21	6
25 - 28	7	16 - 18	8
21 - 24	5	13 - 15	5
17 - 20	3	10 - 12	4
13 - 16	4	1 - 9	3
9 - 12	2		
Mean	26.5 years		17.7 years
S.D.	8.3 years		5.6 years

^aThe information in this table was obtained from central office records, and from the responses of principals to Questionnaire A.

^b"Teaching experience" meant both classroom and administrative experience.

From the records of the central office of the school district, the number of years of tenure of the respondents was obtained. By tenure was meant the number of years that the respondent had been principal of his present school. Only principals who had completed one year of tenure by September 1965, had been selected for the study. Four principals had ten or more years of tenure; six had only one year. The mean number of years of tenure was 5.25; the standard deviation, 3.29 years.

Principals were asked the following question:

What was the latest year in which you received formal education?

- a) On a part-time basis, i.e., summer school or evening courses, 19__.
- b) On a full time or resident basis, 19__.

The year indicated to each part of the question was subtracted from 1966. The mean difference, called recency of part time education, was 7.92 years; the standard deviation, 6.61 years. The mean difference to part "b" of the question, called recency of full time education, was 27.14 years; the standard deviation was 10.64; the range was one year to forty-six.

One of the independent variables was amount of education of the principals. The number of years of formal

education beyond Alberta grade twelve recognized by the school district for salary purposes was used for this purpose. This is done in terms of a six-category classification. Eighteen principals fell in category six; category six is recognition for six or more years of formal education beyond Alberta grade twelve. Seven principals fell in category five; nine in category four; none in three; one in category two and one in category one. (Table VII)

TABLE VII

FREQUENCY DISTRIBUTION OF NUMBERS OF YEARS OF EDUCATION
BEYOND ALBERTA GRADE TWELVE RECOGNIZED BY THE SCHOOL
DISTRICT FOR SALARY PURPOSES^a
(N=36)

Number of years of education recognized by district	1	2	3	4	5	6
Number of principals	1	1	0	9	7	18
Mean	5.05					
Standard deviation	1.20					

^aFigures obtained from the central office records of the school district.

The Schools

The principals were asked to indicate the number of years of education beyond Alberta grade twelve of each teacher on their staff in the elementary grades. As in the case of the principals, this was done by means of the six category

classification used by the school district for salary purposes. The mean number of years of education was computed for each school. These means ranged from 1.7 years to 3.5 years. The mean for all thirty-six schools came to 2.6 years; the standard deviation, to 0.42 years.

Size of school was obtained from the records of the central office. In terms of the number of elementary classrooms per school, the mean was 17.1; the standard deviation, 6.9. The smallest school contained twelve classrooms (smaller schools had been excluded from the sample); the largest, twenty-eight.

IV. STATISTICAL TREATMENT

All information gathered through questionnaires, documental records, and interviews, was transferred to I.B.M. punch cards. Before being transferred, however, a great deal of information had to be transformed. Some of the data needed transformation to be amenable to statistical treatment. Several measures had to be combined to be of use. This section is devoted to this topic.

Normalizing

The development of indices of innovativeness based on the adoption and extent of use of various innovations required

the utilization of some technique that would allow the systematic and logical combination of various measures. Converting the raw scores to make them additive and establishing a numerical value for the combination of measures on each innovation became necessary. This was accomplished, to some measure of success, by a method of conversion based on the C scale described in DuBois.⁴

In the case of the First Index of Innovativeness, the response obtained on the adoption of each innovation was dichotomous. Principals answered "Yes or No" as to whether they made regular use of a particular innovation. These answers were added and then forced into a distribution that would approach the normal distribution. However, because the added "Yes" ranged from two to five only, that is, principals had adopted at least two innovations (five was the number of innovations under study), the resultant distribution does not approach normality too closely. (Table III) However, a comparison of the results obtained through the use of normalized scores and through the use of the raw scores on I_1 , yielded similar results. In the chapter where the findings of the investigation are reported, both Pearsonian correlations

⁴Philip H. DuBois. An Introduction to Psychological Statistics, (New York: Harper & Row, Publishers, 1965), pp. 297-301.

using normalized scores and "t" tests using the raw scores on I_1 , are reported. In the case of the product-moment correlation coefficients, which assumes that the linear-regression model is a good fit to the data,^{5,6} and that the data possess homoscedasticity, normality need not be assumed. However, if two variables with different shaped distributions are correlated, the differences in their shapes will tend to create a deviation from linearity in one or both of the regression lines. This will result in a lower correlation coefficient than would otherwise be expected.⁷ In discussing the uses of the correlation coefficient Hays⁸ states that:

...It is not necessary to make any assumptions at all about the form of the distribution, the variability of Y scores within X columns or "arrays," or the true level of measurement represented by the scores in order to employ linear regression and correlation indices to describe a given set of data. So long as there are N distinct cases, each having two numerical scores, X and Y, then the descriptive statistics of correlation and regression may be used. In so doing we describe the data as though a linear rule were to be used for

⁵George A. Ferguson, Statistical Analysis in Psychology and Education, (New York: McGraw-Hill Book Company, Inc., 1959), p. 110.

⁶Quinn McNemar, Psychological Statistics, (New York: John Wiley and Sons, Inc., 1962), p. 120.

⁷Ferguson, ibid.

⁸William L. Hays, Statistics for Psychologists, (New York: Holt, Rinehart and Winston, 1963), p. 510.

prediction, and this is a perfectly adequate way to talk about the tendency of these numerical scores to associate or "go together" in a linear way in these data.

On the basis of this argument, the product-moment correlation coefficient (or point biserial in case of dichotomous predictors) was used to describe all relationships hypothesized in this study. Normalizing of scores was performed where different measures had to be combined. This was the case in developing both Indices of Innovativeness, in combining norms on innovativeness, in developing the "opinion-sought variable" from the number of times each principal was mentioned as being a source of advice to colleagues and in developing a combined measure of socio-economic level of each attendance area.⁹

SUMMARY

Although the distribution of scores on some variables was markedly skewed, it was decided to use parametric tests. Parametric tests have been found to be very robust with respect to their assumptions. Second, it seemed desirable to use the same type of tests throughout the treatment of the

⁹This measure of socio-economic level is used only in the Regression analysis. It is described in Section II of this Chapter.

data.

The section dealing with the use of the step-wise regression analysis has been omitted from this section. It is located with the results of the analyses in Chapter Five.

CHAPTER V

RESULTS, ANALYSIS, AND DISCUSSION

This chapter contains an analysis of the findings and a discussion of the nine hypotheses. Each hypothesis is reviewed individually.

I. MAS SCORES AND INNOVATIVENESS

Testing Hypothesis One

The first hypothesis predicted an inverse relationship between MAS scores (anxiety) and innovativeness. This hypothesis was not supported. MAS scores and innovativeness show no significant correlation. I_1 and MAS scores were negatively correlated ($r = -0.042$). I_2 and MAS scores were positively related ($r = .032$)

Two "t" tests were also performed to test for significant differences between means on MAS scores of low and high adopters using the number of adoptions made in the case of I_1 . As Table VIII indicates, no significant differences were found. Similar results were obtained by dichotomizing principals into low and high adopters on I_2 (Table IX).

TABLE VIII

A COMPARISON OF MAS SCORES OF
HIGH AND LOW ADOPTERS (I_1)

Category	N	MAS Mean Scores	s^2	F	t
Adopters of 2 or 3 innovations	16	6.13	10.05	1.86	n.s.
Adopters of 4 or 5 innovations	20	6.70	18.71		

TABLE IX

A COMPARISON OF MAS SCORES OF
HIGH AND LOW ADOPTERS (I_2)

Category	N	MAS Mean Scores	s^2	F	t
Principals who obtained 1,2,3,4, 5 on I_2 (Low)	14	6.64	16.55	1.35	n.s.
Principals who obtained 6, 7, 8, 9 on I_2 (High)	22	6.14	12.30		

Discussion of the Findings

As mentioned above, anxiety is a term very loosely used, even by psychologists.¹ It may well be then, that the "type" of anxiety tapped by the Manifest Anxiety Scale, used in this study is not the type of anxiety that the literature on the diffusion and adoption of innovations reports to be a barrier to the adoption of innovations.

Another possible explanation for the failure to substantiate this hypothesis may be in the nature of the instrument and in its use with a sample of principals. Cronbach has pointed out that "the crucial assumptions involved are that the subject is willing to tell the truth to himself and to the investigator, and that the subject can determine the truth."²

Goodstein makes the same point when he writes:

The rather restricted range of A scale scores in a college population, the lack of discrimination over the middle range of A scale scores, and the susceptibility of the A scale to faking have, in part, motivated this interest.³

¹Supra., Chapter Three.

²L.J. Cronbach, Essentials of Psychological Testing, (New York: Harper, 1949), quoted by Edward Kendall, "The Validity of Taylor's Manifest Anxiety Scale," Journal of Consulting Psychology, 18:429, 1954.

³Leonard D. Goodstein, "Interrelationships Among Several Measures of Anxiety and Hostility," Journal of Consulting Psychology, 18:38, 1954.

Even if we accept the assumption that the subjects of our study did not fake, one weakness of the Manifest Anxiety Scale or A scale, may explain the failure to substantiate our hypothesis. This weakness is the lack of discrimination over the middle range. As Table X indicates, one thing is quite clear; the scores on the MAS obtained from the sample of this study are far lower than the ones Taylor obtained. Her sample was comprised of 229 students in an introductory psychology course. She obtained means of 14.94 and 12.92 on a test-retest situation four weeks apart. These two means are significantly different.

TABLE X

A COMPARISON OF MAS SCORES IN TWO STUDIES

	N	\bar{X}	S.D.	Range*
Present Study	36	6.44	3.87	1-16
Taylor's Study ⁺	229	14.94	n.a.	n.a.

*Theoretical maximum score is 28

⁺Janet A. Taylor, "A Personality Scale of Manifest Anxiety," Journal of Abnormal and Social Psychology, 48:285-290, 1953.

Table XI shows the distribution of scores on the MAS. Scores ranged from one to sixteen. The mean and standard deviation were 6.44 and 3.87, respectively.

TABLE XI

DISTRIBUTION OF SCORES ON THE TAYLOR
 MANIFEST ANXIETY SCALE
 (N=36) (Questionnaire H)

Scores	f
16	1
15	1
14	1
13	1
12	0
11	3
10	1
9	1
8	1
7	4
6	4
5	5
4	3
3	6
2	3
1	1
0	0
$\bar{X} = 6.44 \quad S.D. = 3.87$	

Table XII lists the correlation coefficients between MAS scores and a number of variables reported in the study.

TABLE XII
VARIABLES RELATED TO MAS SCORES

Variable	Correlations
Age	.266
Amount of Education	.084
I ₁	-.042
I ₂	.032
Norms on Innovativeness	-.241
Cosmopolitaness	-.033
Opinion Leadership	.059
D.V.I. (Traditionalism)	-.088
Rigidity	.345*
Dogmatism	.072
Professionalism	-.180

* .05 > p > .02, for a two-tailed test.

II. TRADITIONALISM AND INNOVATIVENESS

Testing Hypothesis Two

The second hypothesis posed a negative correlation between traditional values, that is, a high score on the Differential Value Inventory, and innovativeness. Contrary to the findings reported in the literature,⁴ no correlation between values held and innovativeness either as measured through adoption and non-adoption or as measured through extent of use, was discovered.

However, if we dichotomize the scores on the DVI on the basis of the number of innovations adopted, a significant difference between means emerges. The mean on the DVI of all principals who adopted two or three of the five innovations was computed. The same was done for the principals who adopted four or five innovations. A "t" test yielded a difference between means significant at the .05 level.

A "t" test was also used to test for significance of difference between means on the DVI after dividing the principals into two groups: those who obtained a score of 1,2, 3,4,5 on I_2 and a second group made up of principals who obtained 6,7,8,9, on I_2 . No significant difference between means was obtained.

⁴ See Review of the Literature on values, Chapter Three.

TABLE XIII

A COMPARISON OF THE DVI SCORES OF
HIGH AND LOW ADOPTERS (I_1)

Category	N	Mean Value Scores	s ²	F	t
Adopters of 2 or 3 innovations	16	29.0	101.44	1.61	1.87*
Adopters of 4 or 5 innovations	20	24.6	63.14		
* .05 > p > .025 (one tailed-test)					

TABLE XIV

A COMPARISON OF VALUES OF HIGH AND
LOW ADOPTERS (I_2)

Category	N	Mean Value Scores	s^2	F	t
Principals who obtained 1,2,3,4, 5, on I_2	22	28.09	73.22	1.27	n.s.
Principals who obtained 6,7,8, 9 on I_2	14	26.57	54.47		

Discussion of Findings

Hypothesis two was partly substantiated. The mean scores on the Differential Value Inventory (DVI) differed significantly in the case of the First Index of Innovativeness (I_1), but not in the case of the Second Index.

It may be worthwhile to note that the mean value score of our sample is lower than means reported by three investigators that used the DVI in schools. Lupini⁵ obtained a mean value score of 37.44 with a sample of sixty-eight principals in Catholic schools in the Montreal area. As expected, his younger sub-sample of thirty-four principals ranging from twenty-seven to forty-nine years of age obtained a significantly lower mean value score than his sub-sample of older principals. However, even his younger sub-sample, obtained a mean score substantially higher than the one obtained in the present sample of older principals.

Likewise, Abbott⁶ and McPhee⁷ found mean scores

⁵ Dante Lupini, "A Study of the Relation of Differential Values to Social and Administrative Interactions," (unpublished Doctoral dissertation, University of Alberta, Edmonton, 1965).

⁶ Max G. Abbott, "Values and Value-Perceptions of School Superintendents and Board Members," (unpublished Doctoral dissertation, University of Chicago, 1960).

⁷ R.F. McPhee, "The Relationship Between Individual Values, Educational Viewpoints, and Local School Approval" (unpublished Doctoral dissertation, University of Chicago, 1959).

substantially higher (more traditional) with their samples of school trustees, teachers and superintendents. Are we then, in the same situation as apparently we were in the case of the Manifest Anxiety Scale? Has the DVI failed to discriminate in the middle and upper range?

Table XV shows the distribution of scores on the DVI ranging from ten to forty-six. The mean and standard deviation were 27.44 and 8.29 respectively.

Table XVI shows the correlation coefficients between DVI scores and a number of variables used in this study. The significant positive correlation between age and traditional values, i.e., a high score on the DVI, should be noted. Mental rigidity, dogmatism and traditional values are directly related. Amount of education and traditional values, however, are negatively related.

III. DOGMATISM AND INNOVATIVENESS

Testing Hypothesis Three

A negative relationship between dogmatism and innovativeness was hypothesized. As with values and MAS scores, in the main, this hypothesis was not substantiated. A low negative correlation ($-.128$) was established between dogmatism and I_1 . Some individual innovations showed slightly stronger

TABLE XV

DISTRIBUTION OF SCORES ON THE
DIFFERENTIAL VALUE INVENTORY
(N=36) (Questionnaire E)

Scores	f
61-64	0
56-60	0
51-55	0
46-50	1
41-45	2
36-40	2
31-35	8
26-30	8
21-25	8
16-20	5
11-15	1
6-10	1
$\bar{X} = 27.44$ $S.D. = 8.29$	

TABLE XVI
VARIABLES RELATED TO TRADITIONALISM (DVI)

Variable	Correlations
Age	0.412***
Amount of Education	-.346*
Recency of any Formal Education	-.004
I ₁	-.056
I ₂	-.044
Norms on Innovativeness	-.247
Cosmopolitaness	.171
Professionalism	.043
Opinion Leadership	-.003
Mental Rigidity	.454**
Dogmatism	.435**
MAS scores	-.088

* .05 > p > .02, for a two-tailed test.

** p < .01, for a two-tailed test.

*** .02 > p > .01, for a two-tailed test

Pearson "r" of .325 is required for significance at the .05 level for a two-tailed test.

relations: consultants, $-.157$; television, $-.169$; extent of use of television, $-.267$.

To analyze further the relationship between dogmatism and innovativeness, the sample was divided into two groups: principals who adopted two or three of the five innovations were grouped together; principals who adopted four or five innovations formed the other group. The mean score on dogmatism of each group was calculated. No significant difference was established between the means.

TABLE XVII

A COMPARISON OF DOGMATISM SCORES OF
HIGH AND LOW ADOPTERS (I_1)

Category	N	Mean Dogmatism Score	s^2	F	t
Adopters of 2 or 3 innovations	16	151.25	627.9		
				1.50	n.s.
Adopter of 4 or 5 innovations	20	149.65	419.6		

The same statistical technique was used with I_2 ; the results were similar.

TABLE XVIII

A COMPARISON OF DOGMATISM SCORES OF
HIGH AND LOW ADOPTERS (I_2)

Category	N	Mean Dogmatism Score	s ²	F	t
Adopters who obtained 1,2,3, 4,5, on I_2 (Low)	21	149.8	519.4	1.03	n.s.
Adopters who obtained 6,7,8, 9, on I_2 (High)	15	151.13	503.4		

Discussion of the Findings

According to these findings, no relationship exists between dogmatism, as measured by Rokeach's Dogmatism Scale and innovativeness. This finding supports a recent research report.⁸ Childs found that innovative school districts do not have a higher proportion of administrators with open belief systems (low on the Dogmatism scale). He did find, however, that innovative school districts had a significantly higher proportion of teachers with open belief systems.

⁸ John W. Childs, "A Study of Belief Systems of Administrators and Teachers in Innovative and Non-Innovative School Districts," (Paper read at the Annual Meeting of the American Educational Research Association, Chicago, 1966).

Childs found administrators to be less dogmatic than teachers.⁹

As a further research project, it might be worthwhile to investigate the relationship of the scores of principals as compared to the classroom teachers' on the Dogmatism Scale. An explanation of the failure to support the hypothesized relationship between dogmatism and innovativeness in this study might be discovered. If Childs' finding that administrators are less dogmatic than teachers were confirmed, we might speculate that a "selecting out" process exists among teachers.

Table XIX contains the distribution of scores on the Dogmatism Scale. These ranged from 100 to 197. The mean was 150.36; the standard deviation, 22.64.

Table XX lists correlation coefficients between Dogmatism and a number of variables used in the investigation.

IV. MENTAL RIGIDITY AND INNOVATIVENESS

Testing Hypothesis Four

A negative relationship between mental rigidity and innovativeness was predicted. This hypothesis was verified in the case of I_1 and I_2 at the .05 level of confidence.

⁹"Administrators" seems to include both principals and superintendents.

TABLE XIX

DISTRIBUTION OF SCORES ON THE
DOGMATISM SCALE

(N=36) (Questionnaire G)

Scores	f
196-200	1
191-195	0
186-190	2
181-185	2
176-180	1
171-175	0
166-170	4
161-165	4
156-160	1
151-155	3
146-150	2
141-145	1
136-140	3
131-135	4
126-130	3
121-125	3
116-120	1
111-115	0
106-110	0
101-105	0
96-100	1
$\bar{X} = 150.36 \quad S.D. = 22.64$	

TABLE XX
VARIABLES RELATED TO DOGMATISM
(N=36)

Variable	Correlations
Age	.080
Rigidity	.437*
Anxiety	.072
Amount of Education	-.066
I ₁	-.128
I ₂	-.028
Cosmopolitaness	.111
Professionalism	.211
Opinion Leadership	-.099
DVI (Traditionalism)	.435*
* $p < .01$, for a two-tailed test.	

Discussion

The discovery of a direct relationship between mental rigidity and innovativeness seems to be the first reported in the education research tradition. It confirms Rogers'¹⁰ and

¹⁰ Everett M. Rogers, "Personality Correlates of the Adoption of Technological Practices," Rural Sociology, 22: 267-268, 1957.

Copp's¹¹ work in rural sociology.

This direct relationship between mental rigidity and innovativeness in principals may have implications for persons responsible for the selection of principals whom they expect to adopt readily educational innovations.

Related Findings

Contrary to Rokeach's findings, the data of this investigation do not lend support to the distinction that he has found between mental rigidity and dogmatism. These two characteristics show a positive relationship. (Pearson "r" of 0.437, significant beyond the .01 level for a two-tailed test.)

The California Psychological Inventory Manual reports a mean of 9.7 and a standard deviation of 3.4 for a sample of 144 city school superintendents on the F_x scale, i.e., mental rigidity scored in reverse. A "t" test was computed to determine whether there was a significant difference between the mean the Manual reports and the one calculated for the present sample. No significant differences in means were found

¹¹James H. Copp, "Personal and Social Factors Associated with the Adoption of Recommended Farm Practices Among Cattlemen," Kansas A.E.S. Technical Bulletin 83, (Manhattan, 1956), p. 26, quoted in Rogers, ibid.

at the 0.05 level. The C.P.I. Manual also reports no relationship between the Manifest Anxiety Scale and mental rigidity. This was not the case with our sample. A correlation coefficient of .345 has been computed. This is significant at the .05 level for a two-tailed test ($.05 > p > .02$).

TABLE XXI

A COMPARISON BETWEEN THE MENTAL RIGIDITY SCORES OF THE PRINCIPALS IN THIS STUDY AND THOSE OF A SAMPLE OF SUPERINTENDENTS¹²

Study	N	\bar{X}	S.D.	F	t
This Study	36	10.56	4.48	1.74	n.s.
C.P.I.	144	9.7	3.4		

Table XXII shows the distribution of scores on the Gough-Sanford Mental Rigidity Scale. The scores ranged from two to nineteen. The mean score was 10.56; the standard deviation, 4.48.

Table XXIII indicates the correlation coefficients between Mental Rigidity and a number of variables used in the study.

¹²California Personality Inventory Manual, (Palo-Alto, California: Consulting Psychologists Press, 1960), p. 37.

TABLE XXII

DISTRIBUTION OF SCORES ON THE
 GOUGH-SANFORD RIGIDITY SCALE
 (CPI F_x Scale - Questionnaire F)
 (N=36)

Scores	f
21-22	0
16-20	6
11-15	12
6-10	11
1-5	7
$\bar{X}=10.56$ S.D. 4.48	

TABLE XXIII
VARIABLES RELATED TO MENTAL RIGIDITY
(N=36)

Variable	Correlations
Age	.258
Amount of Education	-.135
Dogmatism	.437*
Anxiety	.345*
Norms on Innovativeness	-.353*
Cosmopolitaness	-.127
I ₁	-.279*+
I ₂	-.275*+
Professionalism	-.043
Opinion Leadership	-.025
DVI (Traditionalism)	.454**
*+ p < .05, for a one-tailed test * p < .05, for a two-tailed test. ** p < .01, for a two-tailed test	

V. AMOUNT OF EDUCATION AND INNOVATIVENESS

Testing Hypothesis Five

A direct relationship between amount of education and innovativeness was hypothesized. Two measures of education were used. One was in terms of the number of years the principal's education had been recognized for salary purposes; the six category classification described in Chapters Three and Four was used for this purpose. Contrary to all expectations, no significant relationship was found between the amount of education of the principals and either of the two Indices of Innovativeness. The second measure of education was in terms of a dichotomy: principals with graduate education formed one sub-sample; principals without graduate work, the other. A chi square test between independent proportions yielded no significant results using either Index and graduate education.

Discussion of the Findings

Needless to say, this lack of a relationship between amount of education, whether the number of years past grade twelve or the presence or absence of graduate education was used, was contrary to all expectations. However, the negative relationship between recency of education and innovativeness

leads the investigator to present further hypotheses.

Principals were asked to indicate the year in which they last took a formal course. They were asked to indicate separately, part time education and full time education.¹³ From this, a score entitled recency of education was derived. Basically, the more recent the last formal course taken, the lower was the score. For example, a course taken in 1965 gave a score of one; a course taken in 1964 gave a score of two, and so on.

From the negative correlation between innovativeness and recency of education, part time or full time, the investigator is led to speculate as to the relative importance of amount of education over its recency. Is it the amount of education that principals have, that is a correlate of innovativeness or is it recency? The results shown in Table XXIV point to recency of education. Given the same amount of education, a teacher who has recently taken formal courses is more likely to be an innovative principal than one who has not recently undergone formal education. The results of the two regression analyses where recency of education was used as a predictor, support the contention that recency of

¹³ See Chapter Three, Section IX and Chapter Four, Section III for a more extensive explanation of "recency of education."

TABLE XXIV
EDUCATION AND INNOVATIVENES

Variable	I ₁	I ₂
Recency of full-time formal education	-.177	-.314**
Recency of part-time formal education	-.250*	-.419+
Recency of any formal education	-.257*	-.404***
Amount of education	0.050	0.095

***	.01	>	p	>	.005 for a one-tailed test.
**	.05	>	p	>	.025 for a one-tailed test.
*	.10	>	p	>	.05 for a one-tailed test.
+	p	<			.005 for a one-tailed test.

education (part time basis) is a better predictor of the innovativeness of principals than is the amount of education. (Tables XXXIX and XL).

Table XXV indicates the number of principals with graduate education, that is, seventeen or forty-seven per cent of the sample. The same table indicates the distribution of years of education of principals into the six categories used for salary purposes by the school district.

TABLE XXV
AMOUNT OF EDUCATION OF PRINCIPALS
(N=36)

GRADUATE STUDY			AMOUNT OF EDUCATION BEYOND ALBERTA GRADE TWELVE		
Category	f	%	Category in years	f	%
Principals with graduate study	17	47.2	6	18	50.0
			5	7	19.4
Principals without graduate study	19	52.8	4	9	25.0
			3	0	0.0
			2	1	2.8
			1	1	2.8
Mean:	5.6	S.D.	1.20		

Table XXVI indicates the correlation coefficients between amount of education and a number of variables.

VI. PROFESSIONALISM AND INNOVATIVENESS

Testing Hypothesis Six

A positive relationship between professionalism and innovativeness was hypothesized. A correlation coefficient of 0.257 (Pearson "r", $.10 > p > .05$, for a one-tailed test) exists between professionalism and the first Index of Innovativeness. Professionalism and the second Index (I_2) are even

TABLE XXVI
VARIABLES RELATED TO AMOUNT OF EDUCATION

Variable	Correlations
Age	-.087
Recency of any Formal Education ^a	.041
I ₁	.050
I ₂	.095
Norms on Innovativeness	.168
Cosmopoliteness	.323*
Opinion Leadership	.145
DVI (Traditionalism)	-.346**
Rigidity	-.135
Professionalism	0.103
Dogmatism	-0.066
Anxiety	0.084

* .10 > p > .05 for a two-tailed test.

** .05 > p > .02 for a two-tailed test

^a Measured thus: 1965 = last year in which formal course was taken and then placed in nine categories.

more highly related (Pearson "r" of .352, $.025 > p > .01$, for a one-tailed test). The substantiation of this hypothesis thus confirms previous research done mostly in rural sociology¹⁴ but also in education.¹⁵

Discussion

The Role Attitudes of Principals was used to assess the principals' professional orientation along four criteria: client orientation, orientation to the profession and professional colleagues' competence based on monopoly of knowledge, decision-making authority and control over work.

If professional orientation is directly related to innovativeness, as this study indicates, there are implications for superintendents, and other people responsible for the selection of principals. If people responsible for the selection of principals and the administration of school systems favor the introduction of new educational practices, they ought to consider that principals likely to innovate may not be the most compliant ones to have in the school district. Innovative principals, according to the finding of

¹⁴ Supra., Chapter Three

¹⁵ Richard O. Carlson, Adoption of Educational Innovations, (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1963), pp. 56-60.

this study, tend to give greater consideration to students' needs than to administrative directives where these conflict. They also tend to be oriented to their fellow principals rather than to their superordinates. Innovative principals insist upon autonomy within their schools.

Table XXVII gives the distribution of scores on the Role Attitudes of Principals. These scores ranged from forty-two to seventy-one. The mean was 55.94; the standard deviation, 6.32.

TABLE XXVII

DISTRIBUTION OF SCORES ON THE ROLE
ATTITUDES OF PRINCIPALS
(Professionalism - Questionnaire C)
(N=36)

Scores	f
71-75	1
66-70	2
61-65	3
56-60	15
51-55	8
46-50	6
41-45	1
36-40	0
$\bar{X}=55.94$ S.D.=6.32	
Theoretical Limits: 16-80	

Table XXVIII lists the correlation coefficients between professionalism and a number of variables used in the study.

TABLE XXVIII
VARIABLES RELATED TO PROFESSIONALISM

Variable	Correlations
Age	-.255
Amount of Education	.103
Recency of Any Formal Education ^a	-.210
I ₁	.257
I ₂	.352*+
Norms on Innovativeness	.167
Cosmopolitaness	.345**
Opinion Leadership	.384*
DVI (Traditionalism)	.043
Rigidity	-.043
Dogmatism	.211
MAS	-.180

*+ .025 > p > .01 for a one-tailed test.

** .05 > p > .02 for a two-tailed test.

*** .02 > p > .01 for a two-tailed test.

^a Measured thus: 1965- last year in which formal course was taken and then placed in nine categories.

VII. COSMOPOLITENESS AND INNOVATIVENESS

Testing Hypothesis Seven

More cosmopolite principals, it was hypothesized, are more innovative than their colleagues.

A positive correlation coefficient of .224 ($.10 > p > .05$ for a one tailed-test) indicates the degree of relationship between cosmopoliteness and I_1 . A stronger relationship exists between the same independent variable and I_2 ($r = .409$, $.01 > p > .005$, for a one-tailed test).

Discussion of the Findings

Examination of Table XII reveals striking differences in the coefficients. The adoption of consultants is negatively related to cosmopoliteness but this is quite understandable when one realizes that thirty-four of the thirty-six principals had adopted consultants; the adoption of the use of consultants did not discriminate. Extent of use of consultants was however, significantly correlated to cosmopoliteness (Pearson "r", .335, significantly at the .025 level for a one-tailed test).

The substantiation of this hypothesis confirmed previous findings. However, recommendations as to what activities, such as attending conferences, visiting schools,

et cetera, a superintendent ought to encourage his principals to undertake in order to stimulate their innovativeness, would require a further analysis of the responses in the Index of Cosmopolitaness.

Table XXIX indicates the scores obtained on the Index of Cosmopolitaness. These ranged from twenty-two to thirty-six. The mean score was 29.06; the standard deviation, 3.72.

TABLE XXIX

DISTRIBUTION OF SCORES ON THE INDEX
OF COSMOPOLITENESS

(Questionnaire B)
(N=36)

Scores	f
35-39	2
30-34	15
25-29	15
20-24	4
Mean = 29.06	S.D. = 3.72

Table XXX shows the coefficients of correlation between cosmopolitaness and a number of variables used in the study.

TABLE XXX
VARIABLES RELATED TO COSMOPOLITENESS

Variable		Correlations
Age		.042
Recency of Any Formal Education		-.258
I_1		.224
I_2		.409*+
Norms on Innovativeness		.185
Amount of Education		.323*
Opinion Leadership		.392***
DVI (Traditionalism)		.171
Rigidity		-.127
Professionalism		.345**
Dogmatism		.111
MAS		-.033
<hr/>		
*	.10	$\begin{matrix} \text{p} > .05, \text{ for a two-tailed test.} \end{matrix}$
**	.05	$\begin{matrix} \text{p} > .02, \text{ for a two-tailed test.} \end{matrix}$
***	.02	$\begin{matrix} \text{p} > .01, \text{ for a two-tailed test.} \end{matrix}$
*+	.01	$\begin{matrix} \text{p} > .005, \text{ for a one-tailed test} \end{matrix}$

VIII. OPINION LEADERSHIP AND INNOVATIVENESS

Testing Hypothesis Eight, Part A

A direct relationship between opinion leadership and innovativeness was hypothesized. A correlation coefficient of .237 ($.10 > p > .05$ for a one-tailed test) between I_1 and opinion leadership has been computed. Similarly, a coefficient correlation of 0.257 ($.10 > p > .05$ for a one-tailed test) indicates the degree of relationship between opinion leadership and I_2 . As with cosmopolitaness, a negative relationship (not significant at the 0.05 level) exists between opinion leadership and the adoption of consultants but a positive relationship exists between opinion leadership and the extent of use of consultants. These two divergent directions may be explained by the fact that adoption of consultants did not discriminate among principals; thirty-four of the thirty-six had adopted this innovation.

Discussion of the Findings

Opinion leadership was measured by means of a self-designating opinion leadership questionnaire. However, during the interview, the principals were asked to name the principal whose advice they most frequently sought with respect to educational matters. The number of times each principal

was named was totaled; all totals were rank-ordered and converted into scores.¹⁶ The scores on this measure of opinion leadership were correlated with the scores on the Self-Designating Opinion Leadership Questionnaire. The product moment correlation coefficient of .528 ($p < .005$ for a one-tailed test) was computed. Table XXXI shows the correlation coefficients of opinion leadership assessed through the naming of the principal whose advice is most frequently sought, to the two Indices of Innovativeness. These coefficients are slightly lower than the ones based on the Self-Designating Opinion Leadership Questionnaire. These weaker relationships

TABLE XXXI

CORRELATION COEFFICIENTS: ADVICE-SOUGHT
OPINION LEADERSHIP, I_1 AND I_2
(N=36)

Variables	I_1	I_2	Advice-Sought ^a
Opinion Leadership	.237*	.257*	.528+
Advice-Sought	.227*	.256*	

* $.10 > p > .05$, for a one-tailed test.

+ $p < .005$, for a one-tailed test.

^a Advice-sought is the number of times a principal was named as the most frequent provider of information on educational matters by another principal. The frequencies were put on a nine-point scale.

¹⁶ Philip H. DuBois, An Introduction to Psychological Statistics, (New York: Harper and Row, Publishers, 1965), pp. 297-300.

are readily explained. The principals could only select principals they knew personally or through reputation; principals were quite quick to point out the fact that they generally knew only the principals in their district.¹⁷

This finding of a high correlation between the two methods of assessing opinion leadership attests to the validity of the Self-Designating Opinion Leadership Questionnaire which was adopted from Rogers Self-Designating Opinion Leadership Scale.¹⁸ These results support Rogers' claims to the validity of his Scale.¹⁹

Testing Hypothesis Eight, Part b.

Hypothesis Eight, Part b stated: There is a direct relationship between opinion leadership and cosmopolitaness. This hypothesis was substantiated by this investigation. A correlation coefficient (Pearson "r", .392 significant beyond the .01 level for a one-tailed test) was computed and shows a

¹⁷ Principals and the secretary of the Administrators Association comprised of all administrators employed by the district told the investigators that most principals' meetings were held on a district basis, four in number within the whole school district.

¹⁸ Appended to this report.

¹⁹ Everett M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 230, and Everett M. Rogers, and Johannes C. Van Es, Opinion Leadership in Tradition and Modern Colombian Peasant Communities (East Lansing, Michigan: Michigan State University, 1964), p. 16.

direct relationship between these two variables.

Related Findings

Education and opinion leadership. Only a low correlation ($p > .10$), existed between the amount of formal education of the principal and opinion leadership. This is contrary to what we would expect. However, if we dichotomize principals into a group with graduate education and a second group without graduate work, a positive point biserial correlation between graduate education and opinion leadership ($.05 > p > .025$ for a one-tailed test) results. Recency of any formal education and opinion leadership were related; principals with more recent education enjoyed greater influence. Again this seems to be in line with the hypothesis put forth in the discussion of the relationship between amount of education and innovativeness. Do principals stop to evolve educationally once their formal education is completed? Or do principals assume that they stop to evolve and consequently see themselves as exerting little influence on their colleagues? One might speculate that age is the common factor to all these relationships, but age bore no significant relationship to amount of education, although it did to recency of education. Nor did age bear a significant relationship to innovativeness.

Age and opinion leadership. Age and opinion leadership were negatively related, ($r = .265$, $p > .10$ for a two-tailed test). However, as already pointed out, recency of education and age were strongly related, that is, the older the principal the longer it was since he had taken any formal education. Is recency of education a key to understanding what makes principals influential? Opinion leadership correlated at the .05 level with recency of part-time formal education and at the .01 level with recency of full-time formal education (two-tailed tests).

Professionalism and Opinion Leadership. Principals who rated themselves high on professionalism tended to do likewise on opinion leadership. A positive correlation of .384, significant at the .01 level, for a one-tailed test was computed.

Table XXXII gives the distribution of scores on the Self-Designating Opinion Leadership Questionnaire. These extended from one to six. The mean score was 3.94; the standard deviation, 1.45.

Table XXXIII lists the correlation coefficients between opinion leadership and a number of variables used in the investigation.

TABLE XXXII

DISTRIBUTION OF SCORES ON THE SELF-DESIGNATING
OPINION LEADERSHIP QUESTIONNAIRE

(N=36)

(Questionnaire D)

Scores	f
6	8
5	4
4	10
3	7
2	6
1	1
$\bar{X}=3.94$ S.D.=1.45	

TABLE XXXIII
VARIABLES RELATED TO OPINION LEADERSHIP
(N=36)

Variable	Correlations
Age	-.265
Amount of Education	.145
Recency of any Formal Education	-.318*
I ₁	.237
I ₂	.257
Cosmopolitaness	.392***
DVI (Traditionalism)	-.003
Norms on Innovativeness	.369**
Rigidity	-.025
Professionalism	.384***
Dogmatism	-.099
MAS	.059
Number of Times Named as most Innovative by Other Principals	.390***
Advice-Sought	.528+

* .10 > p > .05, for a two-tailed test.

** .05 > p > .02, for a two-tailed test.

*** .02 > p > .01, for a two-tailed test.

+ p < .01 for a two-tailed test.

IX. NORMS ON INNOVATIVENESS AND INNOVATIVENESS

Testing Hypothesis Nine

This last hypothesis predicted a positive relationship between high norms on innovativeness and innovativeness. The Panel of Judges that ranked the thirty-six schools in the sample was described in previous chapters.²⁰ The three ranks were added together, rank-ordered and then put on a nine-point scale.²¹

Comparisons among the three sets of ratings. Table XXXIV gives the coefficients of the intercorrelations of the ratings of the three judges, and of the combined measure mentioned in the previous paragraph.

The correlation coefficients found in Table XXXVI indicate that the findings of this investigation support other research, i.e., there is a direct relationship between the norms on innovativeness of the social system and the innovativeness of the individual, the principal in this case working in that social system, the school.

²⁰ Supra., Chapter Two and Chapter Four, Section IV. Appendix M reproduces the question put to each judge independently.

²¹ DuBois, op. cit., pp. 297-301.

TABLE XXXIV

NORMS ON INNOVATIVENESS: INTERCORRELATIONS
OF THE SCORES OF THE THREE JUDGES

	Judges			Combined
	1	2	3	
1	1.000	.744	.691	.914
2		1.000	.803	.849
3			1.000	.803
Combined				1.000

All these correlation coefficients (Pearson "r's" were significant beyond the .01 for a two-tailed test.) Using Spearman rho with a correction for tied ranks, yielded correlation coefficients significant at the same level.

Discussion

The substantiation of this last hypothesis has implications for superintendents contemplating the appointment of a principal: a man with all the characteristics of an innovative principal may fail or succeed depending partly on the staff of his school, the facilities available to him, and whatever research into the characteristics of innovative schools might uncover.

The importance of norms on innovativeness showed very clearly in the regression analyses. This variable was the only one retained in three of the four regression analyses because it explained a significant amount of the variance. (Tables XXXVII, XXXVIII, XXXIX).

Table XXXV gives a distribution of the ratings each of the three judges assigned to each school. The same table gives the combined measure entitled Norms on Innovativeness. This is a nine-point scale. The scores ranged from two to nine. The mean score was 5.08. The Standard deviation was 1.78.

TABLE XXXV

NORMS ON INNOVATIVENESS: DISTRIBUTION OF
RATINGS IN SIX CATEGORIES AND SCORES

		Judge	Judge	Judge	Scores	
		One	Two	Three	Combined Measure	
Category	f	f	f	Category	f	
6	4	8	9	9 (highest)	2	
5	7	7	8	8	1	
4	8	4	9	7	3	
3	9	8	4	6	10	
2	3	8	4	5	6	
1	5	1	2	4	7	
				3	4	
				2	3	
				1 (lowest)	0	
				$\bar{X} = 5.08$	S.D. = 1.78	

Table XXXVI indicates the correlation coefficients between Norms on Innovativeness and other variables used.

TABLE XXXVI
VARIABLES RELATED TO NORMS
(N=36)

Variable	Correlations
Age	-.326
Amount of Education	.168
Recency of any Formal Education	-.108
I ₁	.459**+
I ₂	.299*+
Cosmopoliteness	0.185
Opinion Leadership	.369*
DVI (Traditionalism)	-.247
Rigidity	-.353*
Professionalism	.167
Dogmatism	.062
MAS	-.241
Number of times Named as Most Innovative by other Principals	.525**

*+ .05 > p > .025, for a one-tailed test

**+ p < .005, for a one-tailed test.

* .05 > p > .02, for a two-tailed test.

** p < .01, for a two-tailed test.

X. REGRESSION ANALYSIS

Following the correlation of selected variables of our sample with the two indices of innovativeness (I_1 and I_2), an attempt was made to study the multiple relationship of the independent variables with each Index of Innovativeness. The objective was to identify a limited number of variables which would account for a maximum amount of variance in each Index of Innovativeness.

This objective had practical as well as theoretical value. There is little reason for dealing with a large number of variables when a few variables will predict just as well. Moreover, one of the objectives of research is to secure a parsimonious summary of a system of relationships. In the development of empirical generalizations in the adoption of educational innovations research, some form of reduction in the number of variables is imperative.

A major aim of science is such precise description of phenomena and their relationships that accurate forecasts of future findings or happenings become possible... While it seems extremely unlikely that human behaviors will ever be predictable, statistical techniques may be advantageously used in forecasting the behavior of both individuals and groups.²²

²²Philip H. DuBois, op. cit., p. 164.

A step-wise form of regression analysis was used to study the relationship of a combination of independent variables with the dependent variable. One analysis used the nine predictors that are contained in the nine main hypotheses,²³ and the First Index of Innovativeness as the criterion. A second analysis used the same predictors but used the Second Index of Innovativeness as the criterion.

A second series of analyses was performed. In this series, nine predictors were added to the first nine. The additional nine predictors were as follows: age of the principal, the socio-economic level of the attendance area of each school, tenure, i.e., the number of years the principal has been appointed to his present school, the average number of years of education of the teachers in each school as recognized for salary purposes by the school district, the number of times the principal has been named by other principals as the most innovative principal, the number of hours the principal teaches each week, recency of full-time formal education, that is, the last year when he took formal education on a full-time basis subtracted from 1966, recency of part-time formal education and the number of elementary classrooms in

²³Supra., Chapter Three.

the school. Two analyses using eighteen predictors were performed: one with each Index of Innovativeness as the criterion. Tables XXXVII to XL summarize the findings of the four regression analyses.

Variables were discarded if their inclusion in the regression analysis failed to contribute a significant increment to the explained variance. Only "t" values higher than necessary for significance as predictors at the 0.05 level in multiple regression were retained. These "t" values are described in the following way.

The quantity t_n ...which is distributed in a t-distribution with $N-n-1$ degrees of freedom is a measure of the contribution of the variable X_n to the regression after the variables X_1, X_2, \dots, X_{n-1} have been included in the regression.²⁴

To reduce the inflation that arises from a relatively small sample a corrected R was computed.²⁵

The First Regression Analysis

The nine predictors used were MAS scores, traditionalism (DVI), dogmatism, mental rigidity, amount of education,

²⁴ Department of Computing Science, "Multiple Regression," (Edmonton: Department of Computing Science, University of Alberta, 1964), p. 6. (Mimeographed.)

²⁵ Henry E. Garrett, Statistics in Psychology and Education, (New York: David McKay Co., 1958), p. 416.

professionalism, cosmopolitaness, opinion leadership and norms on innovativeness; the criterion was the First Index of Innovativeness. Nearly twenty-four per cent of the variance in innovativeness as assessed by I_1 was explained by three predictors: norms on innovativeness, professionalism and dogmatism. Other variables, traditionalism, MAS scores, and mental rigidity contributed to the variance but were dropped from the analysis because the "t" test failed to indicate a significant difference in adding the last variable to the regressions analysis. Table XXXVII summarizes the results.

TABLE XXXVII

RESULTS OF FIRST REGRESSION ANALYSIS
 INDEX ONE (I_1) GROUP ONE⁺
 (N=36)

Order of Entry in Regression Analysis	Variable Name	Computed R	Corrected R_c^*	Cumulative Per cent of Variance Ac- counted for by R_c
1	Norms on In- novativeness	.459	.459	21.09
2	Professional- ism	.494	.473	22.37
3	Dogmatism	.541	.489	23.91

* The procedure described by Henry E. Garrett, Statistics in Psychology and Education, (New York: David McKay Co. Inc., 1958), p. 416, was used to correct for the inflation of R because of small sample sizes.

⁺ Group one used nine predictors; the nine predictors were the nine used in the hypotheses, namely, amount of education, norms on innovativeness, cosmopolitaness, professionalism, opinion leadership, traditionalism (DVI), mental rigidity, dogmatism, and MAS scores.

The Second Regression Analysis

The same predictors were used in this analysis; the criterion was the Second Index of Innovativeness (I_2). In this case, cosmopolitanism, norms on innovativeness and professionalism explained twenty-one per cent of the variance in Innovativeness as assessed by I_2 . If we compare the first and the second analyses, we notice that norms on innovativeness and professionalism appear in both analyses; cosmopolitanism has replaced dogmatism in the second analysis. As in the case of the first analysis where the "t" test failed to indicate a significance in the addition of the last variable to the regression equation, the rest of the variables were dropped; the three to be dropped were mental rigidity, MAS scores and amount of education.

TABLE XXXVIII

RESULTS OF SECOND REGRESSION ANALYSIS
 INDEX TWO (I_2) GROUP ONE
 (N=36)

Order of Entry in Regression Analysis	Variable Name	Computed R	Corrected R_c	Cumulative Per cent of Variance Ac- counted for by R_c
1	Cosmopolite- ness	.409	.409	16.73
2	Norms on Inno- vativeness	.468	.443	19.62
3	Professional- ism	.509	.463	21.44

The Third Regression Analyses

This analysis included the same nine predictors as the first and second analyses but nine other predictors were added; age of the principal, the socio-economic level of the attendance area of each school, tenure, i.e., the number of years the principal has been appointed to his present position, the average education of the teachers in each school, the number of times the principal has been named by other principals as the most innovative principal, the number of hours the principal teaches each week, recency of full-time formal education, recency of part-time formal education, and the number of elementary classrooms in the school. The criterion was I_1 . Only two predictors were retained in the regression analysis: norms on innovativeness and recency of part-time education. Socio-economic level, number of elementary classrooms, professionalism and dogmatism came next but were dropped because the "t" test failed to indicate a significant difference in adding the last variable to the regression analysis. Norms on innovativeness again appeared as a high predictor.

The Fourth Regression Analysis

This last analysis used the same eighteen predictors as the previous analysis; the criterion was I_2 . Five predictors were retained in the analysis: number of times the

TABLE XXXIX

RESULTS OF THIRD REGRESSION ANALYSIS
 INDEX ONE (I_1) GROUP TWO⁺
 (N=36)

Order of Entry in Regression Analysis	Variable Name	Computed R	Corrected R_c	Cumulative Per cent of Variance Ac- counted for by R_c
1	Norms on Inno- vateness	.459	.459	21.07
2	Recency of Part- time education	.501	.479	22.94

+ Group Two used eighteen predictors, the nine used in the first two analyses plus age, socio-economic level of the school attendance area, the number of years the principal has been principal of his present school (tenure), the average number of years of education of the teachers on the school staff, the number of times the principal has been named as most innovative by other principals, the number of hours the principal teaches per week, the recency of part-time education, the recency of full-time education and the number of elementary classrooms in the school.

principal was named as the most innovative by other principals, cosmopolitaness, recency of part-time education, tenure and the number of hours the principal teaches per week. These five variables explained forty-two per cent of the variance in I_2 . If we compare the third and fourth analyses, we notice that recency of part-time education is retained in both analyses.

TABLE XL

RESULTS OF FOURTH REGRESSION ANALYSIS
 INDEX TWO (I_2) GROUP TWO
 (N=36)

Order of Entry in Regression Analysis	Variable Name	Computed R	Corrected R_c	Cumulative Per cent of Variance Ac- counted for by R_c
1	Number of Times Principal named as most Innova- tive	.451	.451	20.34
2	Cosmopolitaness	.573	.555	30.80
3	Recency of Part- time education	.628	.598	35.76
4	Tenure	.666	.618	38.19
5	Number of Hours Principal teaches	.694	.651	42.38

IX. SUMMARY

This chapter dealt with the findings of the research. Ten hypotheses were tested. Contrary to expectations no significant relationship was established between amount of education, traditional values, dogmatism, and MAS scores on the one hand and innovativeness on the other. The relationships expected between norms on innovativeness, cosmopolitaness, professionalism, opinion leadership and mental rigidity were generally borne out. The direct relationship between opinion

leadership and cosmopolitaness was also substantiated.

Four step-wise regression analyses were undertaken. Two used the nine independent variables contained in the hypotheses; the other two used an additional nine predictors. The first Index of Innovativeness and the Second Index of Innovativeness were used as the criterion in each case. Norms on innovativeness was retained in three analyses. No other predictor appeared in three of the four regression analyses.

CHAPTER VI

SUMMARY, CONCLUSIONS, FURTHER RESEARCH AND IMPLICATIONS

I. SUMMARY

The Theory

Everett Rogers has developed a theory of the diffusion and adoption of innovations. He developed his theory after examining over five hundred research studies on the topic in different diffusion of innovation research traditions: anthropology, sociology, rural sociology, education, industrial and medical sociology.

Three major aspects of the adoption theory are: 1) the processes that individuals pass through in adopting an innovation, 2) the characteristics of individuals based on the rate at which they adopt innovations, and 3) the variables which influence an individual as he goes through the adoption process.

The adoption process. Every individual passes through five stages in adopting new ideas.

1. The awareness stage. During the awareness stage, the individual or group becomes interested in the innovation and seeks information about it.

2. The interest stage. During the interest stage, the individual or group becomes interested in the innovation and seeks information about it.

3. The evaluation stage. During the evaluation stage, the individual mentally applies the innovation and decides whether or not to try it.

4. The trial stage. During the trial stage, the innovation is used on a small scale.

5. The adoption stage. The adoption stage consists of the decision to continue the innovation in full and continued use.

An individual can decide to reject an idea during any of these stages. He can also decide to discontinue the use of an innovation after he has initially adopted it.

Adopter categories. On the basis of the research evidence he used to develop his theory, Rogers identified five adopter categories: 1) innovators, 2) adopters, 3) early majorities, 4) late majorities, 5) laggards. The variable used to place an individual within one of these categories was the rate at which he adopted most innovations. Rogers analyzed the values, personal characteristics, communication behavior, and social relationships of the individuals in each of the five adopter categories.

Influences on the adoption process. The core of the adoption process theory is diagrammed in the accompanying figure. This figure attempts to depict the various influences at work on an individual as he passes through the five adoption stages. In general, there are three types of influences related to the individual's decision to accept or reject an innovation. One set emanates from the individual himself and from his initial perception of the situation in which the innovation takes place. The second set of influences concerns the sources of information an individual uses, or that are available to him. The third set of influences concerns the characteristics of the innovation as perceived by the individual.

1. Antecedents. The influence that comes from the person and the situation are known as antecedents. These are the factors present in the person and the situation prior to the introduction of an innovation. One set of antecedents consists of the actor's own identity; the second is the person's perception of the situation.

2. Sources of information. The sources from which an individual receives information about a proposed new practice likely influences his decision to adopt it or reject it. Information can be either personal or impersonal. An

PARADIGM OF THE ADOPTION OF AN INNOVATION BY AN INDIVIDUAL WITHIN A SOCIAL SYSTEM*

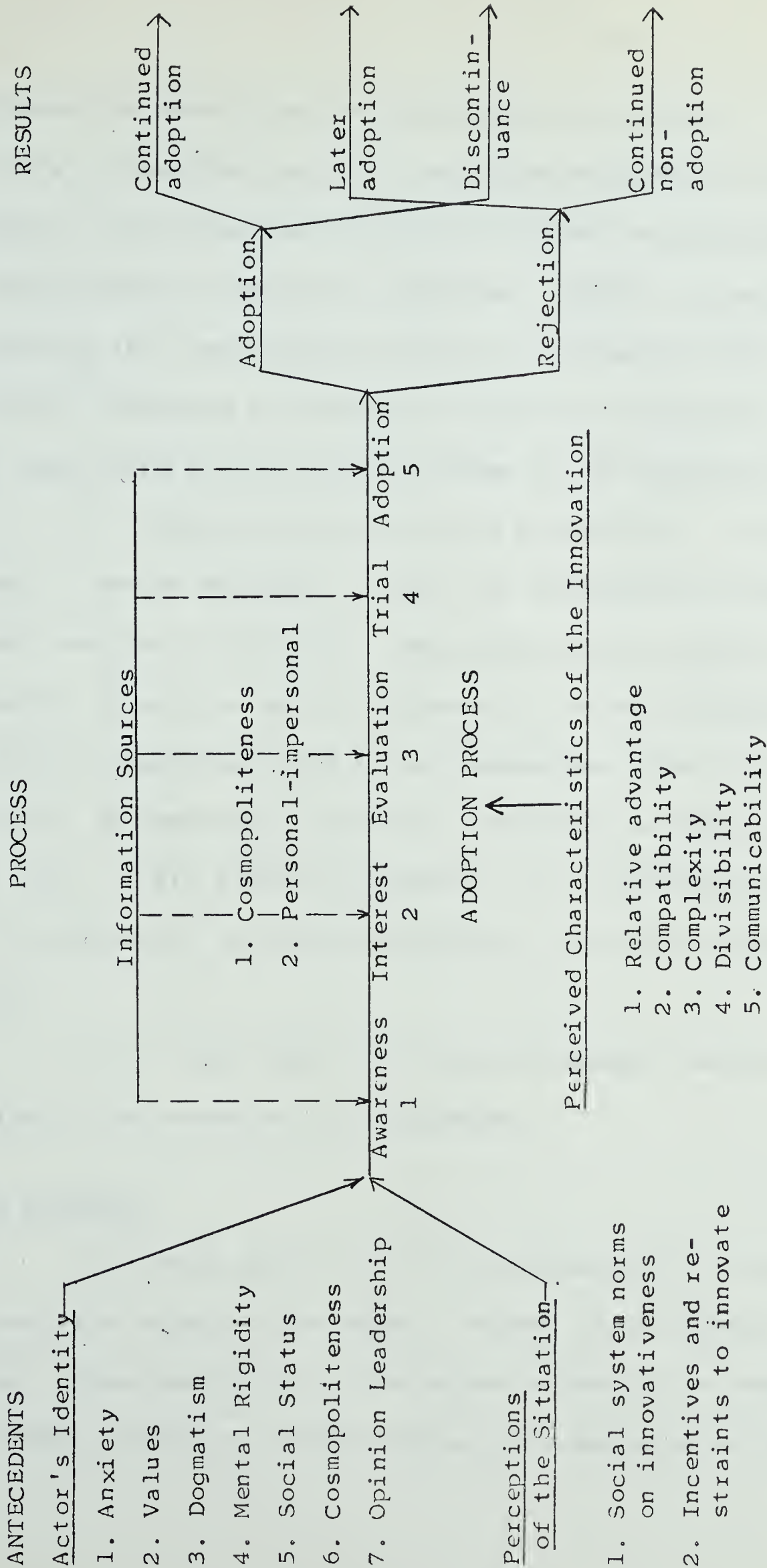


FIGURE 1

*Adapted from E.M. Rogers, Diffusion of Innovations, (New York: The Free Press of Glencoe, 1962), p. 306.

information source can be cosmopolite or localite. A cosmopolite information source is one from outside of a person's group. An information source from within an individual's reference group is known as localite. Rogers' investigations revealed that impersonal sources of information and cosmopolite sources influence categories of adopters differently and vary in importance in the various stages of the adoption process.

3. Characteristics of the innovation. It does not seem to matter whether, in fact, an innovation has advantages over the idea it replaces. What does seem to matter is whether or not the actor perceives it to have advantages. The five characteristics of an innovation which are considered by an individual when he is deciding to reject or adopt it are: 1) its relative advantage, 2) its compatibility, 3) its complexity, 4) its divisibility, and 5) its communicability.

This study dealt with some antecedent variables related to the adoption of innovations.

The Problem

The study dealt with the applicability of some of the hypotheses arising from Rogers' theory to the educational setting. More specifically, the study attempted to answer the following question: Which variables considered to hold strong

relationships by Rogers, namely, values, anxiety, mental rigidity, dogmatism, status, opinion leadership, and social system norms on innovativeness, account for most of the variance in principals' innovativeness.

Hypotheses

For purposes of investigation the major problem, the applicability of Rogers' theory to the adoption of educational innovations, was divided into nine major hypotheses and one minor one.

Inverse relationships were hypothesized between anxiety, traditional values, dogmatism, mental rigidity, and innovativeness. Direct relationships between amount of education, professional orientation, cosmopolitaness, opinion leadership, norms on innovativeness, and innovativeness were hypothesized. It was also hypothesized that opinion leadership and cosmopolitaness would be directly related.

Sample

All the elementary principals in a public school district in a large Western Canadian city who were in at least their second consecutive year as principal of their present school, whose schools contained a minimum of twelve elementary classrooms and where junior high school classes constituted

no more than twenty per cent of the total number of classrooms in the school were asked to participate. A sample of thirty-six principals participated in the study out of a possible number of thirty-nine.

Instrumentation

Anxiety, values, dogmatism, mental rigidity were assessed by means of the Manifest Anxiety Scale, Prince's Differential Value Inventory, Rokeach's Dogmatism Scale, and the F_x Scale of the California Psychological Inventory, respectively. Professionalism and opinion leadership were measured by means of adaptations of the Role Attitudes of Teachers and Rogers' Self-Designating Opinion- Leadership Scale. A General Questionnaire, an Interview Schedule which dealt chiefly with the five innovations under consideration, namely, departmentalization in grades four, five and six, consultants, parent-teacher interviews during school hours, French instruction in grades five and six, and television, and an Index of Cosmopolitaness were designed for the study. Social system norms on innovativeness were assessed by means of judges' ratings.

Related Literature

The literature on the diffusion and adoption of innovations was reviewed in some detail. A brief review of the literature related to each independent variable was also made. All the hypotheses tested in this study were made either because they proved useful in other studies especially in research traditions other than education or because other researchers suggested them as a result of their work. Hypotheses not tested extensively in previous research work have tended not to be supported in this investigation.

Collection of Data

Three methods were used in collecting the data: questionnaires, interviews, and documental records. All the principals in the study were called to a meeting by the Superintendent of the Department of Elementary Education of the school district. The purpose and methods of the study were explained to the principals by the investigator. Two questionnaires were completed on this occasion. The respondents took the other questionnaires to complete at home. These were collected on the occasion of the interview by the investigators. Some records of the school district were made available to the investigators. The planning officer of the city, his counterpart and other members of the central

office of the school district provided some of the data.

Statistical Treatment

Methods of linear correlation were the predominant statistical devices used in testing the hypotheses. A multi-step method of regression analysis was also used. In a number of instances, "t" tests were used but these tests generally provided results no different than correlation methods.

Results

The first three hypotheses predicting an inverse relationship between Manifest Anxiety Scale scores, dogmatism, traditional values and innovativeness were not substantiated; no significant correlation was established between these variables and either of the two indices of innovativeness. Hypothesis five, predicting a direct relationship between amount of formal education of the principals, and their innovativeness, was not supported.

Hypothesis four, positing an inverse relationship between mental rigidity and innovativeness was supported. Hypotheses six, seven, eight and nine which predicted direct relationships between professionalism, cosmopolitaness, opinion leadership, and social norms on innovativeness respectively and innovativeness were substantiated. A sub-hypothesis

directly relating cosmopolitaness and opinion leadership was also verified.

II. CONCLUSIONS

The sample with which this investigation was carried out makes generalizations subject to great caution. The sample was not randomly selected. All the principals worked for the same urban school system. Only four had taught outside Alberta; three had been principals outside the province. However, thirty-two of the thirty-six principals had once taught outside the city school district where the investigation was carried out. A similar study done on a provincial scale might yield very different results. Notwithstanding these restrictions, this study has substantiated the hypotheses found to hold generally in the rural, medical and education diffusion of innovation traditions. Although not every hypothesis was verified, there is no evidence to warrant the rejection of the unverified hypotheses as irrelevant to the study of innovativeness in education. The personal and social correlates of innovativeness in rural sociology seem pertinent to the study of innovativeness in education. Before questioning the theory supporting relationships between values, anxiety, dogmatism and amount of education with

innovativeness, perhaps the instruments used to measure these predictors should be re-examined.

On the basis of our results, there is some evidence to indicate that the typical innovative principal tends to be relatively young, to be appointed to a school in a relatively high socio-economic area of the district; he is cosmopolite, professionally-oriented, influential among his peers. He tends to be mentally flexible and to be viewed as being an innovator by his fellow principals. Moreover, he has recently been educated or has taken formal courses recently. His school tends to be staffed by teachers who favor the introduction of new educational practices.

III. FURTHER RESEARCH

This study opens up several avenues for additional research. Some of the instruments used, namely, the Index of Cosmopolitenes, the Role Attitudes of Principals, the Self-Designating Opinion Leadership Questionnaire could be the object of analysis. The Taylor Manifest Anxiety Scale, the Dogmatism Scale, and the Differential Values Inventory could be investigated as to their discriminating power among principals and teachers in general. The variable these instruments purport to tap could presumably be tapped more

fruitfully by other instruments. A replication of the study on a sample less homogeneous than ours seems to be, might yield useful results. The amount of education of principals might stand further investigation. Would a sample with a greater range of educational attainment yield positive results?

IV. IMPLICATIONS

The findings and conclusions of this study have practical implications for practicing school administrators and for organizations intent on introducing change into the schools. They also have implications for the study of educational administration and for the investigation of organizational activity.

The stereotype of the older traditional principal seems, at least, partly justified. The acceptance of this stereotype raises the questions as to the advisability, in an era of rapid change, of appointing principals on the basis of seniority.

In professional development programs, superintendents and other persons concerned with the introduction of change, could capitalize on the presence of influential principals and of cosmopolite principals to introduce educational

innovations into the schools. If opinion leadership is important in the diffusion of innovations within a school district, opportunities for principals to meet together should be made readily available.

The results of this study also point to the importance of continuing education for principals; the longer principals have been away from formal courses, the less innovative they are. This may be related to the positive relationship between cosmopolitaness and innovativeness. Principals who have taken formal university courses recently have probably read more, known more teachers and principals from other school districts.

This study seems to offer a few clues for strategies of change in education and needed researches for this purpose.

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APPENDICES

APPENDIX A

QUESTIONNAIRE A

GENERAL INFORMATION

QUESTIONNAIRE A

SCHOOL _____ PRINCIPAL _____ CODE _____

1. How many hours do you teach each week?

- | | |
|-----------------|-------------------|
| a. nil _____ | f. 9 or 10 _____ |
| b. 1 or 2 _____ | g. 11 or 12 _____ |
| c. 3 or 4 _____ | h. 13 or 14 _____ |
| d. 5 or 6 _____ | i. 15 or 16 _____ |
| e. 7 or 8 _____ | |

2. What was your major academic subject at university?

3. Which subject are you most interested in teaching?

4. For how many years have you been a principal?

5. For how many years have you taught (classroom and administration) for:

(a) Edmonton Public School Board? _____

(b) Jasper Place or Beverly Divisions before amalgamation? _____

6. For how many years have you been a principal for:

(a) Edmonton Public School Board? _____

(b) Jasper Place or Beverly Division before amalgamation? _____

7. (a) At which Edmonton, Jasper Place or Beverly school were you teaching immediately prior to your promotion as vice-principal or principal? _____

(b) Who was the principal in that school at that time?

8. What was the latest year in which you received formal education?

(a) On a part time basis, i.e. summer school or evening courses, 19 ____.

(b) On a full time or resident basis, 19 ____.

9.(a) Which of the following practices would you consider to be innovations in the elementary schools operated by the Edmonton Public School Board?

programmed learning _____

modern maths _____

use of educational telecasts _____

organization of in-service education by the principal _____

use of radio _____

organized lunch-hour and after school intramural sports _____

requests for help from EPSB consultants _____

use of tape-recorders _____

regular showing of 16 mm. films _____

team teaching _____

use of subject teachers, rather than generalists _____

the teaching of French _____

regular scheduling of parent-teacher interviews during school hours _____

(b) What other practices would you consider as innovations?

10. What is your religious preference?

1. Anglican _____

5. none _____

2. Catholic _____

6. Presbyterian _____

3. Jewish _____

7. United Church _____

4. Lutheran _____

8. Other - Specify

11. What was your father's occupation when you graduated from high school?

APPENDIX B

QUESTIONNAIRE B

INDEX OF COSMOPOLITENESS

QUESTIONNAIRE B

1. Which newspapers do you regularly read? (Exclude the Edmonton Journal). Please write the titles down.

0. none

1. _____

2. _____

3. _____

4. _____

5. _____

2. Which magazines do you regularly read? Exclude professional journals. Please write the titles of the magazines.

0. none

1. _____

2. _____

3. _____

4. _____

5. _____

3. Which professional journals do you regularly read? Please indicate the titles.

0. none

1. _____

2. _____

3. _____

4. _____

5. _____

Please circle Yes or No.

Yes No 4. Barring unforeseen changes, would you remain with the E.P.S.B. permanently?

Yes No 5. Were you a teacher in this school immediately preceding your appointment as principal here?

- Yes No 6. Have you ever taught outside Alberta?
- Yes No 7. Have you ever taught outside Edmonton, Jasper Place, and Beverly, but within Alberta?
- Yes No 8. Were you ever a principal outside Alberta?
- Yes No 9. Were you ever a principal outside Edmonton, Jasper Place, and Beverly, but within Alberta?
- Yes No 10. Would you accept a position with the Calgary Public Schools which would mean a distinct improvement in your professional career?
- Yes No 11. Would you accept a position with a city school board outside Alberta which would mean a distinct improvement in your professional career?

Please check off () the appropriate spaces.

12. To which Specialist Council(s) do you belong?

- ☐ a) Business Education Council
- ☐ b) English Council
- ☐ c) Fine Arts Council
- ☐ d) Guidance Council
- ☐ e) Health and Physical Education Council
- ☐ f) Home Economics Council
- ☐ g) Industrial Arts and Vocational Education Council
- ☐ h) Mathematics Council
- ☐ i) Modern and Classical Language Council
- ☐ j) Council on School Administration
- ☐ k) School Library Council
- ☐ l) Science Council
- ☐ m) Social Studies Council

13. To which educational organizations do you belong? Leave out the A.T.A. and its Councils, and the C.T.F. Add the names of those that do not appear on this list but to which you belong.

- ☐ a) Phi Delta Kappa
- ☐ b) American Educational Research Association
- ☐ c) The Canadian College of Teachers
- ☐ d) _____
- ☐ e) _____

14. How many schools have you visited in the past six months to observe new educational practices? Circle the correct number.

0. none	5. five
1. one	6. six
2. two	7. seven
3. three	8. eight or more
4. four	

15. With how many teachers and administrators not employed by the E.P.S.B. but living in Alberta do you regularly discuss new educational practices. Include correspondence. Circle the appropriate number.

none	6. six
1. one	7. seven
2. two	8. eight
3. three	9. nine
4. four	10. ten
5. five	11. eleven or more

16. With how many teachers and administrators living outside Alberta do you regularly discuss new educational practices. Include correspondence. Circle the appropriate number.

none	6. six
1. one	7. seven
2. two	8. eight
3. three	9. nine
4. four	10. ten
5. five	11. eleven or more

- Yes No 17. Would you say that you get most of your intellectual stimulation from sources outside E.P.S.B. personnel?

- Yes No 18. Would you say that you get most of your professional stimulation from E.P.S.B. personnel?

19. In which political and/or social and/or civic organizations are you an active member? Leave out strictly educational or professional organizations but include such organizations as the Better Education Association.

20. Do you usually feel more satisfied after a teachers' meeting which features: (Check one of the following blanks)

an outstanding local speaker _____

an outstanding outside speaker _____

21. Some people have said that the teaching profession is composed of two types of persons: (Indicate by a single check in one of these four blanks which type of persons you are like)

I am a little like this type of person	I am very much like this type of person.
--	---

Persons who are more
interested in local
problems.

1 _____

2 _____

Persons who are more
interested in prob-
lems everywhere.

3 _____

4 _____

APPENDIX C

QUESTIONNAIRE C

ROLE ATTITUDES OF PRINCIPALS

QUESTIONNAIRE C

The following section is designed to measure principals' attitudes to their role in the school system.

There are five possible answers to each statement. They are:

STRONGLY AGREE (SA)
 AGREE (A)
 UNDECIDED (U)
 DISAGREE (D)
 STRONGLY DISAGREE (SD)

For each statement circle the answer which indicates your attitude towards the statement.

1. It should be permissible for the principal to violate a rule if it is felt that the best interests of the students will be served in doing so. SA A U D SD
2. Unless the principal is satisfied that it is best for the students, a principal should not do anything which he is told to do. SA A U D SD
3. A good principal should not do anything that may jeopardize the interests of the students regardless of who gives the directive or what the rule states. SA A U D SD
4. Principals should try to live up to what they think are the standards of the profession even if the central office staff or the community does not seem to respect them. SA A U D SD
5. One primary criterion of a good school should be the degree of respect that it commands from other principals around the province. SA A U D SD

6. A principal should try to put the standards and ideals of good administration into practice even if the rules or procedures of the system prohibit it. SA A U D SD
7. Principals should subscribe to and read diligently the standard professional journals. SA A U D SD
8. A principal should be an active member of the Council on School Administration. SA A U D SD
9. A principal should attend all Administrators' Association meetings. SA A U D SD
10. A principal should consistently practice ideas of the best educational (administrative practices) even though the central office staff holds other views. SA A U D SD
11. The major skill which a principal should develop is an acquaintance with the best administrative practices. SA A U D SD
12. Principals should be evaluated primarily on the basis of their administrative ability and on the basis of their ability to build an effective staff. SA A U D SD
13. No one should be appointed to the principalship unless he has at least some graduate courses in administration. SA A U D SD
14. Principals should be able to make their own decisions about most problems that come up in their school. SA A U D SD
15. Small administrative matters should not have to be referred to someone in central office for a final answer even though no precedent may exist of such a decision being reached by a principal. SA A U D SD
16. The ultimate authority over the major educational decisions should be exercised by qualified principals in their own schools. SA A U D SD

APPENDIX D

ROLE ATTITUDES OF TEACHERS

ROLE ATTITUDES OF TEACHERS

The following section is designed to measure teachers' attitudes to their role in their school. All teachers are to reply to this section and in addition all administrators are asked for their opinions on what they feel the teacher's role in the school should be.

There are five possible answers to each statement. They are:

Strongly Agree (SA)	Disagree (D)	
Agree (A)	Undecided (U)	Strongly Disagree (SD)

For each statement circle the answer which indicates your attitude towards the statement.

1. It should be permissible for the teacher to violate a rule if it is felt that the best interests of the student will be served in doing so. SA A U D SD

2. Unless a teacher is satisfied that it is best for the student, a teacher should not do anything which the teacher is told to do. SA A U D SD

3. A good teacher should not do anything that may jeopardize the interests of the teacher's students regardless of who gives the directive or what the rule states. SA A U D SD

4. Teachers should try to live up to what they think are the standards of the profession even if the administration or the community does not seem to respect them. SA A U D SD

5. In view of the teacher shortage, it should be permissible to hire teachers with letters of permission. SA A U D SD

- | | | | | | | |
|-----|--|----|---|---|---|----|
| 6. | A teacher should try to put the standards and ideals of good teaching into practice even if the rules or procedures of the school discourage it. | SA | A | U | D | SD |
| 7. | Teachers should subscribe to and read diligently the standard professional journals. | SA | A | U | D | SD |
| 8. | A teacher should be an active member of at least one specialist association. | SA | A | U | D | SD |
| 9. | A teacher should attend all local association meetings. | SA | A | U | D | SD |
| 10. | A teacher should consistently practice ideas of the best educational practices even though the administration prefers other views. | SA | A | U | D | SD |
| 11. | The major skill which a teacher should develop is an acquaintance with the subject matter. | SA | A | U | D | SD |
| 12. | Teachers should be evaluated primarily on the basis of their knowledge of the subject that they teach and on the basis of their ability to communicate it. | SA | A | U | D | SD |
| 13. | Schools should hire no one to teach unless the person holds at least a bachelor's degree in education. | SA | A | U | D | SD |
| 14. | One primary criterion of a good school should be the degree of respect that it commands from other teachers around the province. | SA | A | U | D | SD |
| 15. | Teachers should be able to make their own decisions about problems that come up in the classroom. | SA | A | U | D | SD |
| 16. | The ultimate authority over the major educational decisions should be exercised by qualified teacher. | SA | A | U | D | SD |

APPENDIX E

QUESTIONNAIRE D

SELF-DESIGNATING OPINION LEADERSHIP QUESTIONNAIRE

QUESTIONNAIRE D

Please answer the following six questions by circling your answer in the margin.

- Yes: No 1. During the past six months have you told any principal about some new teaching practice? or educational innovation?
- a b 2. Compared with principals you know (a) are you more or (b) are you less likely to be asked for advice about new teaching practices or educational innovations?
- a b 3. Thinking back to your last discussion about some educational innovation, (a) were you asked for your opinion of the new practice or (b) did you ask someone else?
- a b 4. When you and your friends discuss new ideas about education, what part do you play?
(a) mainly listen or (b) try to convince them of your ideas?
- a b 5. Which of these happens more often, (a) do you tell your teachers about some new idea in education, or (b) do they tell you about a new practice?
- Yes No 6. Do you have the feeling that you are generally regarded by other principals as a good source of advice about new educational ideas?

APPENDIX F

SELF-DESIGNATING OPINION LEADERSHIP SCALE

1. During the past six months have you told anyone about some new farming practice?
2. Compared with your circle of friends (a) are you more or (b) are you less likely to be asked for advice about new farming practices?
3. Thinking back to your last discussion about some new farm practice, (a) were you asked for your opinion of the new practice or (b) did you ask someone else?
4. When you and your friends discuss new ideas about farm practices, what part do you play? (a) mainly listen or (b) try to convince them of your ideas?
5. Which of these happens more often, (a) do you tell your neighbors about some new farm practice, or (b) do they tell you about a new practice?
6. Do you have the feeling that you are generally regarded by your friends and neighbors as a good source of advice about new farm practices?

APPENDIX G

QUESTIONNAIRE E

THE DIFFERENTIAL VALUE INVENTORY

QUESTIONNAIRE E

Instructions

Your name should NOT be placed on this questionnaire

This questionnaire consists of a number of statements about things which you may think you ought or ought not to do and feel. These statements are arranged in pairs as in the examples below:

- | | |
|--|--------|
| 1. A . . be reliable | 1. A B |
| B . . be friendly | |
| 2. A . . work on a project with others | 2. A B |
| B . . work on a project alone | |

To help you make the required choice, when reading the item to yourself, precede each statement with the phrase, "I ought to..." That is, in the examples given, you choose the item which is most desirable for you. If you feel that you ought to work on a project with others more strongly than you feel that you ought to work on a project alone, you should draw a circle around the letter A following the pair of items, thus:

- | | |
|--|----------|
| 2. A . . work on a project with others | 2. (A) B |
| B . . work on a project alone | |

If you feel more strongly about B than A, circle B.

- | | |
|--|----------|
| 2. A . . work on a project with others | 2. A (B) |
| B . . work on a project alone | |

THIS IS NOT A TEST. You are merely asked to indicate your opinions and feelings regarding a variety of subjects. Work rapidly. First impulses are important. Please answer ALL questions.

Choose between statements A and B. Precede each statement with the phrase, "I ought to..."

1. A . . work harder than most of those with a similar job. 1. A B
 B . . work at least as hard as most of those with a similar job.
2. A . . do many things with other people. 2. A B
 B . . do things which are out-of-the-ordinary.
3. A . . have my own firm ideas about politics and religion. 3. A B
 B . . allow the opinions of my friends and associates to influence my thinking on these matters.
4. A . . enjoy myself often by doing things with others. 4. A B
 B . . seek satisfaction by doing many things on my own.
5. A . . attain a higher position than my father or mother attained. 5. A B
 B . . enjoy more of the good things of life than my father and mother enjoyed.
6. A . . feel that since the future is uncertain I should take advantage of my present opportunities. 6. A B
 B . . feel that the future holds more opportunities for me than the present.
7. A . . feel that happiness is the most important thing in life to me. 7. A B
 B . . feel that enduring suffering and pain is important for me in the long run.
8. A . . obtain advice from others in making decisions. 8. A B
 B . . be independent of others in making decisions.
9. A . . feel it is my duty to save as much money as I can. 9. A B
 B . . feel that saving is good but not to the extent that I must deprive myself of all present enjoyment.
10. A . . put ten dollars in the bank. 10. A B
 B . . spend five of the ten dollars enjoying myself with my friends.

11. A . . spend enough on clothes to dress as well as my friends and associates. 11. A B
 B . . spend less on clothes in order to save for future needs.
12. A . . put in long hours of work without distraction. 12. A B
 B . . feel that I can't work long hours without distraction but I'll get the job done anyway.
13. A . . feel that it is most important to live for the future. 13. A B
 B . . feel that today is important and I should live each day to the fullest.
14. A . . feel that what is right for me may not be right for others. 14. A B
 B . . feel that I should be firm in my beliefs about what is right or wrong.
15. A . . work hard to do most things better than others. 15. A B
 B . . work hard at some things and leave others to those who are more qualified than I.
16. A . . feel that everybody misbehaves once in a while but the important thing is not to make the same mistake over again. 16. A B
 B . . feel that the most important thing in life is to strive for peace with God.
17. A . . feel that work should come before pleasure. 17. A B
 B . . feel that pleasure is necessary to develop the well-rounded individual.
18. A . . consider what others think when deciding about right and wrong. 18. A B
 B . . feel that my own convictions about right and wrong are all that really matter.
19. A . . defend my ideas about right and wrong. 19. A B
 B . . be willing to be convinced on matters of right and wrong because these terms have different meanings for different people.
20. A . . make as many social contacts as possible. 20. A B
 B . . be willing to sacrifice myself for a better world.

21. A . . get all my work done by my own efforts. 21. A B
B . . get my work done with the help of others if
I am allowed to.
22. A . . wear clothes similar to those of my friends. 22. A B
B . . dress modestly even though this makes me
different than my friends.
23. A . . work hard to earn enough money to enjoy some 23. A B
of the luxuries of life.
B . . work hard at doing something original regard-
less of pay.
24. A . . get a job which will allow me to enjoy some 24. A B
of the luxuries of life.
B . . get a job which will make me a success in life.
25. A . . be able to solve difficult problems and 25. A B
puzzles.
B . . feel that difficult problems and puzzles are
good for some people but are not for every-
body.
26. A . . feel that style is more important than quality 26. A B
in clothes.
B . . feel that quality is more important than style
in clothes.
27. A . . say what I think is right about things. 27. A B
B . . be careful not to say things that will
offend others.
28. A . . feel comfortable doing as well as most peo- 28. A B
ple with a similar job.
B . . feel comfortable doing better than most
others with a similar job.
29. A . . have strong personal feelings about correct 29. A B
behavior.
B . . feel that the group has the right to decide
what kind of behaviour it will approve.
30. A . . feel that discipline in the family today is 30. A B
not as strict as it should be.
B . . feel that change from strict discipline in
today's family is a good one.

31. A . . feel that one of the primary things in life is to gain knowledge useful to me in the future. 31. A B
- B . . feel that one of the primary things in life is to learn to get along with people.
32. A . . do things without regard to what others may think. 32. A B
- B . . do things which allow me to have fun and be happy.
33. A . . register for an adult education course which is very interesting to me, whether or not it will do me some good later on. 33. A B
- B . . register for an adult education course which is uninteresting to me but which will do me some good later on.
34. A . . attend a First of July celebration to enjoy myself being with people. 34. A B
- B . . attend a First of July celebration because it is my duty to be loyal to my country.
35. A . . feel it is right to spend less for clothes in order to save for the future. 35. A B
- B . . feel that whether one wants to spend more for clothes and save less or vice versa is a matter of opinion.
36. A . . try to do original and creative things. 36. A B
- B . . share my ideas and work cooperatively with others.
37. A . . use expressions that are common among my friends and associates. 37. A B
- B . . use only correct expressions when I speak.
38. A . . feel that it is right to save for the future. 38. A B
- B . . feel that whether or not it is right to save for the future is up to the individual.
39. A . . choose a job with plenty of opportunities for advancement even though the pay isn't as high as I would like it to be. 39. A B
- B . . choose a job in which I can work with many interesting people.

40. A . . mix in a little pleasure with my work so that I don't get bored. 40. A B
 B . . keep at a job until it is finished.
41. A . . get as much pleasure as I can out of life now. 41. A B
 B . . stand by my convictions.
42. A . . feel that everyone should be sociable even if it means occasional misbehavior. 42. A B
 B . . feel guilty when I misbehave and expect to be punished.
43. A . . feel that children should obey decisions of their parents. 43. A B
 B . . feel that children should be able to do many of the things their friends do.
44. A . . be very ambitious. 44. A B
 B . . be very sociable.
45. A . . choose a job which will permit me to have as many luxuries as most of my friends. 45. A B
 B . . choose a job which promises advancement even though the pay is lower than that of my friends.
46. A . . get the kind of job which will bring me in contact with many interesting people. 46. A B
 B . . get the kind of job which will make me a success in life.
47. A . . feel that whether or not it is right to plan and save for the future is a matter of opinion. 47. A B
 B . . feel that it is right to plan and save for the future.
48. A . . be willing to sacrifice myself for the sake of a better job. 47. A B
 B . . feel it is important to behave like most other people do.
49. A . . deny myself enjoyment for the present for better things in the future. 48. A B
 B . . have fun attending parties and being with people.

50. A . . be satisfied to do as well in life as my father did. 50. A B
B . . attain a higher position in life than my father attained.
51. A . . feel that it will be good for me later if I endure some unpleasant things now. 51. A B
B . . feel that whether or not I should be willing to endure unpleasant things now because it will be good for me later is a matter of opinion.
52. A . . be able to have most of the things my friends have. 52. A B
B . . be able to have enough money to lay away for future needs.
53. A . . feel that happiness is the most important thing in life. 53. A B
B . . feel that being respected is the most important thing in life.
54. A . . feel that more "old-fashioned whippings" are needed today. 54. A B
B . . feel that it is up to individual parents to decide whether or not children should be whipped.
55. A . . exert every effort to be more successful this year than I was last year. 55. A B
B . . be content with a reasonable amount of success and live longer.
56. A . . try very hard to overcome my emotions. 56. A B
B . . get as much pleasure as I can out of life now.
57. A . . feel it is very important to be more successful this year than I was last year. 57. A B
B . . feel it is more important to get along well with others.
58. A . . feel that what is sinful for one person may be acceptable for another. 58. A B
B . . feel that I should avoid even the appearance of sin.

59. A . . spend as much time as I can in working in-
dependently. 59. A B
B . . spend as much time as I can in having fun.
60. A . . deny myself enjoyment for the present for
better things in the future. 60. A B
B . . be able to have as much enjoyment as my
friends have.
61. A . . feel that it is right to be very ambitious. 61. A B
B . . feel that it may or may not be right to be
very ambitious depending on the individual.
62. A . . choose to work with people I like in a job I
don't like. 62. A B
B . . choose to work with people I don't like in a
job which I like.
63. A . . work as hard as I can in order to be success- 63. A B
ful.
B . . work as hard as I can in order to enjoy some
of the luxuries of life.
64. A . . strive to be an expert at something. 64. A B
B . . do many things well but not be an expert
in anything.

PLEASE MAKE SURE YOU ANSWERED ALL QUESTIONS

APPENDIX H

QUESTIONNAIRE F

THE GOUGH-SANFORD RIGIDITY SCALE

QUESTIONNAIRE F

Directions: Answer TRUE (T) or FALSE (F) for each statement by putting a circle around the appropriate letter, i.e., T or F.

- | | | |
|---|---|---|
| T | F | 1. I am often the last one to give up trying to do a thing. |
| T | F | 2. There is usually only one best way to solve most problems. |
| T | F | 3. I prefer work that requires a great deal of attention to detail. |
| T | F | 4. I often become so wrapped up in something I am doing that I find it difficult to turn my attention to other matters. |
| T | F | 5. I dislike to change my plans in the midst of an undertaking. |
| T | F | 6. I never miss going to church. |
| T | F | 7. I usually maintain my own opinions even though many other people may have a different point of view. |
| T | F | 8. I find it easy to stick to a certain schedule, once I have started it. |
| T | F | 9. I do not enjoy having to adapt myself to new and unusual situations. |
| T | F | 10. I prefer to stop and think before I act even on trifling matters. |
| T | F | 11. I try to follow a program of life based on duty. |
| T | F | 12. I usually find that my own way of attacking a problem is best, even though it doesn't always seem to work in the beginning. |
| T | F | 13. I am a methodical person in whatever I do. |
| T | F | 14. I think it is usually wise to do things in a conventional way. |
| T | F | 15. I always finish tasks I start, even if they are not very important. |
| T | F | 16. I often find myself thinking of the same tunes or phrases for days at a time. |

- T F 17. I have a work and study schedule which I follow carefully.
- T F 18. I usually check more than once to be sure that I have locked a door, put out the light, or something of the sort.
- T F 19. I have never done anything dangerous for the thrill of it.
- T F 20. I believe that promptness is a very important personality characteristic.
- T F 21. I am always careful about my manner of dress.
- T F 22. I always put on and take off my clothes in the same order.

APPENDIX I

QUESTIONNAIRE G

THE DOGMATISM SCALE

QUESTIONNAIRE G

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one.

Write +1, +2, +3, or -1, -2, -3, depending on how you feel in each case.

+1: I AGREE A LITTLE

-1: I DISAGREE A LITTLE

+2: I AGREE ON THE WHOLE

-2: I DISAGREE ON THE WHOLE

+3: I AGREE VERY MUCH

-3: I DISAGREE VERY MUCH

- | | |
|-------|--|
| _____ | 1. The United States and Russia have just about nothing in common. |
| _____ | 2. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent. |
| _____ | 3. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups. |
| _____ | 4. It is only natural that a person would have a much better acquaintance with ideas he believes in than with ideas he opposes. |
| _____ | 5. Man on his own is a helpless and miserable creature. |
| _____ | 6. Fundamentally, the world we live in is a pretty lonesome place. |
| _____ | 7. Most people just don't give a "damn" for others. |
| _____ | 8. I'd like it if I could find someone who would tell me how to solve my personal problems. |

- _____ 9. It is only natural for a person to be rather fearful of the future.
- _____ 10. There is so much to be done and so little time to do it in.
- _____ 11. Once I get wound up in a heated discussion I just can't stop.
- _____ 12. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.
- _____ 13. In a heated discussion I generally become so absorbed in what I am going to say that I forget to listen to what the others are saying.
- _____ 14. It is better to be a dead hero than to be a live coward.
- _____ 15. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.
- _____ 16. The main thing in life is for a person to want to do something important.
- _____ 17. If given the chance I would do something of great benefit to the world.
- _____ 18. In the history of mankind there have probably been just a handful of really great thinkers.
- _____ 19. There are a number of people I have come to hate because of the things they stand for.
- _____ 20. A man who does not believe in some great cause has not really lived.
- _____ 21. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.
- _____ 22. Of all the different philosophies which exist in this world there is probably only one which is correct.
- _____ 23. A person who gets enthusiastic about too many causes is likely to be a pretty "wishy-washy" sort of person.
- _____ 24. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.

- _____ 25. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.
- _____ 26. In times like these, a person must be pretty selfish if he considers primarily his own happiness.
- _____ 27. The worst crime a person could commit is to attack publicly the people who believe in the same thing he does.
- _____ 28. In times like these it is often necessary to be more on guard against ideas put out by people or groups in one's own camp than by those in the opposite camp.
- _____ 29. A group which tolerates too much differences of opinion among its own members cannot exist for long.
- _____ 30. There are two kinds of people in this world: those who are for the truth and those who are against the truth.
- _____ 31. My blood boils whenever a person stubbornly refuses to admit he's wrong.
- _____ 32. A person who thinks primarily of his own happiness is beneath contempt.
- _____ 33. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.
- _____ 34. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.
- _____ 35. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.
- _____ 36. In the long run the best way to live is to pick friends and associates whose tastes and beliefs are the same as one's own.
- _____ 37. The present is all too often full of unhappiness. It is only the future that counts.
- _____ 38. If a man is to accomplish his mission in life it is sometimes necessary to gamble "all or nothing at all."
- _____ 39. Unfortunately, a good many people with whom I have discussed important social and moral problems don't really understand what's going on.
- _____ 40. Most people just don't know what's good for them.

APPENDIX J

QUESTIONNAIRE H

THE TAYLOR MANIFEST ANXIETY SCALE

QUESTIONNAIRE H

Circle T for TRUE or F for FALSE for each statement.

1. T F I am often sick to my stomach.
2. T F I am about as nervous as other people.
3. T F I work under a great deal of strain.
4. T F I blush as often as others.
5. T F I have diarrhea ("the runs") once a month or more.
6. T F I worry quite a bit over possible troubles.
7. T F When embarrassed I often break out in a sweat which is very annoying.
8. T F I do not often notice my heart pounding and I am seldom short of breath.
9. T F Often my bowels don't move for several days at a time.
10. T F At times I lose sleep over worry.
11. T F My sleep is restless and disturbed.
12. T F I often dream about things I don't like to tell other people.
13. T F My feelings are hurt easier than most people.
14. T F I often find myself worrying about something.
15. T F I wish I could be as happy as others.
16. T F I feel anxious about something or someone almost all of the time.
17. T F At times I am so restless that I cannot sit in a chair for very long.
18. T F I have often felt that I faced so many difficulties I could not overcome them.
19. T F At times I have been worried beyond reason about something that really did not matter.
20. T F I do not have as many fears as my friends.
21. T F I am more self-conscious than most people.
22. T F I am the kind of person who takes things hard.

- 23. T F I am a very nervous person.
- 24. T F Life is often a strain for me.
- 25. T F I am not at all confident of myself.
- 26. T F At times I feel that I am going to crack up.
- 27. T F I don't like to face a difficulty or make an important decision.
- 28. T F I am very confident of myself.

APPENDIX K

INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

SCHOOL _____ PRINCIPAL _____ CODE _____

1. Have you made it a regular practice during your tenure as principal of this school, to have staff members appointed to report to you concerning innovations which they feel would be useful?

Yes _____ No _____

2. What would be the average percentage turnover of staff during your tenure as principal of this school? _____%

3. How many teachers on your staff fit into each of the six salary schedule categories?

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____

4. (a) Does this distribution fairly represent the situation during your tenure?

Yes _____ No _____

- (b) If No, has the general level of training increased _____ or decreased _____?

5. How do you rate the desire of the Edmonton Public School Board administration to introduce innovations into the elementary program?

a. very high _____

b. high _____

c. well above average _____

d. just above average _____

e. just below average _____

f. well below average _____

g. low _____

h. very low _____

6. Choose from the Edmonton Public School Board elementary school principals whom you know, the three you consider to be the most innovative. Rank in order.
1. _____
2. _____
3. _____
7. Rank the three E.P.S.B. elementary school principals to whom you turn most frequently for advice about the school program.
1. _____
2. _____
3. _____
8. How would you rate yourself with respect to time of adoption of innovations as compared with other E.P.S.B. elementary school principals?
- | | |
|------------------------------|-------|
| a. very early | _____ |
| b. relatively early | _____ |
| c. just earlier than average | _____ |
| d. just later than average | _____ |
| e. relatively late | _____ |
| f. very late | _____ |
9. Which person or group do you consider to be the most accurate assessor of your work as a principal?
- _____
10. How do you rate your freedom to introduce innovations into your school?
- | | |
|-----------------------------------|-------|
| a. completely free | _____ |
| b. considerable amount of freedom | _____ |
| c. slight amount of freedom | _____ |
| d. slightly restricted | _____ |
| e. considerably restricted | _____ |
| f. completely restricted | _____ |

11. With which three elementary school principals in your school district do you have the greatest amount of voluntary association? List in order. (Three best friends)
1. _____
 2. _____
 3. _____
12. Which person or group do you consider to be the most important assessor of your work as a principal?
- _____
13. What overall competence rating would you give your present staff as compared with other teachers you know?
- a. very high _____
 - b. high _____
 - c. well above average _____
 - d. just above average _____
 - e. average _____
 - f. just below average _____
 - g. well below average _____
 - h. low _____
 - i. very low _____
14. How has the overall staff competence changed during your tenure as principal?
- a. improved _____
 - b. no significant change _____
 - c. decreased _____
15. What overall rating would you give your present staff for cooperation with you?
- a. very high _____
 - b. high _____
 - c. well above average _____
 - d. just above average _____
 - e. average _____
 - f. just below average _____
 - g. well below average _____
 - h. low _____
 - i. very low _____

16. How has the staff's cooperation with you changed during your tenure as principal?
- a. improved _____
 - b. no significant change _____
 - c. decreased _____
17. How do you rate the extent of participation by your present staff in professional meetings and conferences?
- a. very high _____
 - b. high _____
 - c. well above average _____
 - d. just above average _____
 - e. average _____
 - f. just below average _____
 - g. well below average _____
 - h. low _____
 - i. very low _____
18. How has this participation altered during your tenure as principal?
- a. improved _____
 - b. no significant change _____
 - c. decreased _____

I. DEPARTMENTALIZATION - Meaning that one teacher teaches the same subject to more than one class in grades four, five, and six.

1. a. Did you use this practice in any other school in which you were principal?

Yes _____ No _____ Not Applicable _____

1. b. If Yes, when did you introduce it? 19____

2. Are you at present using departmentalization?

Yes _____ No _____

If Yes, 3. In which subjects are you using it?

How many teachers are teaching it to more than one class?

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. When did you first use it in this school? 19____.

5. Was departmentalization being used when you were appointed to this school?

Yes _____ No _____

6. Where did the suggestion for departmentalization of your school come from?

a. You _____ If so, where did you first hear of the practice as being applicable to elementary schools?

- e. Communicability - the relative ease of communicating the ideas and/or results of elementary school departmentalization to other principals.

1	2	3	4	5	6	7	8	9
not								easily
communicable								communicable

COMMENTS

II. USE OF SCHOOL BOARD CONSULTANTS

- 1.(a) Did you use this practice in any other school in which you were principal?

Yes _____ No _____ Not Applicable _____

(b) If Yes, when did you introduce it? 19__

2. Are you at present using departmentalization?

Yes _____ No _____

If Yes

3. How frequently have you asked for consultative help as compared with the number of times that you feel such help might have been of use?

1	2	3	4	5	6
never	very seldom	seldom	usually	very frequently	always

4. When did you first use it in this school? 19__

5. Were consultants being used in this school prior to your appointment? Yes _____ No _____

6. What is the most common source of suggestions for the use of E.P.S.B. consultants?

a. You _____

b. Staff _____

c. Central office _____

d. Others _____ Specify _____

If No

7. Have you ever regularly requested help from E.P.S.B. consultants?

Yes _____ No _____

8. When did you first regularly request this help? 19__

9. When did you discontinue requesting this help on a regular basis? 19__.

10. Please rate the use of E.P.S.B. consultants in terms of the following characteristics.

- a. Relative Advantage - the relative advantage of using school board consultants in achieving the goals of elementary education as compared with the use of consultants, such as the principal, who are resident in the school.

1	2	3	4	5	6	7	8	9
no								100%
advantage								advantage

- b. Compatability - the degree to which the practice of using E.P.S.B. consultants is compatible with other aspects of elementary education.

1	2	3	4	5	6	7	8	9
least								most
compatible								compatible

- c. Complexity - the relative difficulty of using E.P.S.B. consultants as compared with using resident staff in the elementary school.

1	2	3	4	5	6	7	8	9
not								very
complex								complex

- d. Divisibility - the degree to which consultants may be used on a limited basis

1	2	3	4	5	6	7	8	9
not								easily
divisible								divisible

- e. Communicability - the relative ease of communicating the ideas and/or results of the use of consultants to other principals.

1	2	3	4	5	6	7	8	9
not								easily
communicable								communicable

COMMENTS

III. INTERVIEWS WITH PARENTS - This practice means the occasional provision of time for parents to meet teachers during normal school hours by dismissing classes earlier than usual.

1.(a) Did you use this practice in any other school in which you were principal?

Yes _____ No _____ Not Applicable _____

(b) If Yes, when did you introduce it? 19____

2. Are you at present using this practice?

Yes _____ No _____

If Yes 3. On how many occasions did you use this practice last year? _____

4. When did you first use it in this school? 19____

5. Was this practice of providing for parent-teacher interviews being used when you were appointed to this school? Yes _____ No _____

6. Where did the suggestion for this practice come from?

a. You _____ If so, where did you first hear of the practice as being applicable to elementary schools?

b. Staff _____

c. Central office _____

d. Others _____ Specify _____

If No 7. Have you ever regularly provided time for teachers to meet parents during school hours?

Yes _____ No _____

If Yes

8. When did you first introduce it? 19____

9. When did you discontinue this practice? 19____

10. Please rate the practice of scheduling parent-teacher interviews during school hours in terms of the following characteristics.

- a. Relative Advantage - the relative advantage of using scheduled parent-teacher interviews during school hours in achieving the aims of elementary education as compared with holding interviews outside of school hours.

1	2	3	4	5	6	7	8	9
no								100%
advantage								advantage

- b. Compatability - the degree to which the practice of holding parent-teacher interviews during school hours is compatible with other aspects of elementary education.

1	2	3	4	5	6	7	8	9
least								most
compatible								compatible

- c. Complexity - the relative difficulty of holding parent-teacher interviews during school hours as compared with out of school hours.

1	2	3	4	5	6	7	8	9
not								very
complex								complex

- d. Divisibility - the degree to which such arrangements for parent-teacher interviews may be tried on a limited basis (not involving the whole school).

1	2	3	4	5	6	7	8	9
not								easily
divisible								divisible

- e. Communicability - the relative ease of communicating to other principals the ideas and/or results of holding parent-teacher interviews during school hours.

1	2	3	4	5	6	7	8	9
not								easily
communicable								communicable

COMMENTS

IV. FRENCH INSTRUCTION - watching the French lessons on TV is not considered as French instruction, unless follow-up teaching also occurs.

1.(a) Was French instruction given in any other school in which you were principal?

Yes _____ No _____ Not applicable _____

(b) If Yes, when did you introduce it? 19____

2. Do you have any teachers on your staff capable of teaching French?

Yes _____ No _____

If Yes 3. Is there at present any French instruction given in your school?

Yes _____ No _____

4. How many teachers are capable of giving French instruction? _____

5. How many teachers are giving French instruction? _____

6. When did you first arrange for French instruction in this school? 19____

7. Was French instruction being given when you were appointed to this school?

Yes _____ No _____

8. Where did you get the idea to introduce French instruction?

a. You _____ If so, where did you first hear of the practice?

b. Staff _____

c. Central Office _____

d. Others _____ Specify _____

If No 9. Have you requested that a teacher capable of teaching French be added to your staff?

Yes _____ No _____

- d. Divisibility - the degree to which French can be taught on a limited basis. (not involving the whole school).

1	2	3	4	5	6	7	8	9
not								easily
divisible								divisible

- e. Communicability - the relative ease of communicating the ideas and/or results of providing French instruction in the elementary schools.

1	2	3	4	5	6	7	8	9
not								easily
communicable								communicable

COMMENTS

V. USE OF TELEVISION AS AN EDUCATIONAL AID

1.(a) Did you use television in any other school in which you were a principal?

Yes _____ No _____ Not Applicable _____

1.(b) If Yes, when did you introduce it? 19__

2. Are you at present using your TV set(s) regularly in the school?

Yes _____ No _____

If Yes 3(a) How many hours per week is each set used?

3(b) How many classes use each set per week, either individually or as part of a larger group?

(Number of hours of use of each set per week

=

)

4. When did you first use it in this school? 19__

5. Was television being used in this school when you were appointed?

Yes _____ No _____

6. Where did the suggestion for using TV in your school first come from?

a. You _____ If so, where did you first hear of the practice as applicable to elementary schools?

b. Staff _____

c. Central office _____

d. Others _____ Specify _____

If No 7. Have you ever used it? Yes _____ No _____

If Yes

8. When did you first introduce it? 19__

9. When did you discontinue using it? 19__

10. Please rate the use of TV in terms of the following characteristics:

- a. Relative Advantage - the relative advantage of the use of TV in achieving the aims of elementary education.

1	2	3	4	5	6	7	8	9
no								100%
advantage								advantage

- b. Compatability - the degree to which the use of TV is compatible with other aspects of elementary education.

1	2	3	4	5	6	7	8	9
least								most
compatible								compatible

- c. Complexity - the relative difficulty of incorporating telecasts into the regular programme.

1	2	3	4	5	6	7	8	9
not								very
complex								complex

- d. Divisibility - the degree to which television may be used on a limited basis. (not involving the whole school).

1	2	3	4	5	6	7	8	9
not								easily
divisible								divisible

- e. Communicability - the relative ease of communicating to other principals the ideas and/or results of using telecasts in the elementary school.

1	2	3	4	5	6	7	8	9
not								easily
communicable								communicable

COMMENTS

APPENDIX L

DATA SHEET

DATA SHEET

SCHOOL _____ PRINCIPAL _____ CODE _____

1. Age range

34 - 37 _____
 38 - 41 _____
 42 - 45 _____
 46 - 49 _____
 50 - 53 _____
 54 - 57 _____
 58 - 61 _____
 62 - 65 _____

2. Salary in 1965-66 \$ _____

3. (a) Number of pupils 1965-66 _____

(b) Number of pupils 1964-65 _____

4. (a) Number of teachers 1965-66 _____

(b) Number of teachers 1964-65 _____

5. Pupil-teacher ratio

(a) 1965-66 _____ : _____ = _____ : _____

(b) 1964-65 _____ : _____ = _____ : _____

6. Ratio of men: women on staff

(a) 1965-66 _____ : _____ = _____ : _____

(b) 1964-65 _____ : _____ = _____ : _____

7. Amount of audio-visual equipment per classroom

= $\frac{\text{no. of pieces of a-v equip't.}}{\text{no. of classrooms}}$

= _____ =

8. Socio-economic area in which the school is located.
9. Total number of years of teaching experience _____
10. Number of years as principal of present school _____
11. Actual degrees and diplomas held.
12. Level of university education
- a. less than a bachelor's degree _____
 - b. one bachelor's degree _____
 - c. two bachelor's degrees _____
 - d. one graduate diploma _____
 - e. two graduate diplomas _____
 - f. master's degree (M. Ed.) _____
 - g. M. Ed., and B.A. or B. Sc. _____
 - h. graduate study beyond master's degree _____
13. No. of years of university education for salary purposes _____
14. (a) Degrees obtained outside Alberta YES _____ NO _____
- (b) Degree _____ Where _____

APPENDIX M

QUESTIONNAIRE SUBMITTED TO THREE OFFICIALS
OF THE DEPARTMENT OF ELEMENTARY EDUCATION,
EDMONTON PUBLIC SCHOOL BOARD

APPENDIX M

QUESTIONNAIRE SUBMITTED TO THREE OFFICIALS OF THE DEPARTMENT OF ELEMENTARY EDUCATION OF THE SCHOOL DISTRICT NORMS ON INNOVATIVENESS

Consider that you wish to introduce new educational practices (innovations) into the elementary schools of the district. How would you rate the receptiveness to new practices of the schools whose names are on the cards? Sort the cards into six piles, considering the principal as being only one of the factors which affect the receptiveness of a school to new practices.

SCORES

Least receptive to change						Most receptive to change					
1	2	3	4	5	6						

APPENDIX N

TABLE XLI CORRELATION COEFFICIENT OF THE NINE PREDICTORS
WITH EACH INNOVATION AND EACH INDEX

TABLE XLII INTERCORRELATION MATRIX OF ALL VARIABLES
INCLUDED IN THE REGRESSION ANALYSIS

TABLE XLI

CORRELATION COEFFICIENTS OF THE NINE PREDICTORS
WITH EACH INNOVATION AND EACH INDEX

(N=36)

	Department I ₁	Consultants I ₁	Interviews I ₁	French I ₁	Television I ₁	H ₁	Department I ₂	Consultants I ₂	Interviews I ₂	French I ₂	Television I ₂	I ₂
Education	.080	-.191	-.137	.082	.098	.050	.089	.214	-.188	.119	.001	.095
Norms	.138	-.057	.322	.044	.125	.459	.016	.310	.357	.024	.019	.299
Cosmopolitaness	.170	.355	.335	.176	-.030	.224	.226	.335	.294	.110	-.017	.409
Professionalism	.365	-.117	.082	.117	.039	.257	.369	.142	.151	.269	-.043	.352
Opinion Lead.	.164	-.176	.477	-.131	.172	.237	-.009	.346	.231	-.151	.097	.257
DVI (Tradition.)	.053	-.002	-.031	.302	-.268	-.056	.145	-.043	-.068	.197	-.196	-.044
Rigidity	-.113	.030	-.091	-.185	-.270	.279	-.076	-.083	-.201	-.025	-.088	.275
Dogmatism	.106	-.157	-.126	.210	-.169	-.128	.177	.097	-.028	.233	-.267	-.028
Anxiety	-.249	.091	.173	-.229	.064	-.042	-.139	.121	.035	-.025	.074	.032

* $p < .05$, for a one-tailed test.** $p < .025$, for a one-tailed test.*** $p < .01$, for a one-tailed test.

TABLE XLII
INTERCORRELATION MATRIX OF ALL VARIABLES INCLUDED IN THE REGRESSION ANALYSIS
(N=36)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Age	1.000	-.058	.408	-.087	-.326	.042	-.255	-.265	.412	.258	.080	.266	.011	-.298	.077	.458	.744	.100	-.262	-.315
2. Socio-economic level		1.000	-.181	.476	.350	.159	.101	.247	-.148	-.186	-.132	-.071	.334	.373	-.412	.014	-.091	.415	.306	.281
3. Tenure			1.000	-.313	-.281	-.026	.128	.178	.385	.341	.053	.208	-.098	.010	.173	.062	.281	.032	-.189	-.241
4. Education				1.000	.168	.323	.103	.145	-.346	-.135	-.066	.084	.286	.214	-.466	-.013	-.194	.373	.050	.095
5. Norms on innovativeness					1.000	.185	.167	.369	-.247	-.353	.062	-.241	.220	.525	-.561	-.113	-.308	.572	.459	.399
6. Cosmopoliteness						1.000	.345	.392	.171	-.127	.111	-.033	.280	.129	-.198	-.245	-.130	.185	.224	.409
7. Professionalism							1.000	.384	.043	-.043	.211	-.180	.082	.364	-.067	-.187	-.202	.027	.252	.352
8. Opinion leadership								1.000	-.003	-.025	-.099	.059	.068	.390	-.386	-.302	-.447	.294	.237	.257
9. DVI (Traditionalism)									1.000	.454	.435	-.088	-.025	-.178	.322	.021	.307	-.219	-.056	-.044
10. Mental rigidity										1.000	.437	.345	.106	-.265	.448	.251	.125	-.252	-.279	-.275
11. Dogmatism											1.000	.072	.326	.081	.086	.185	.037	-.016	-.128	-.028
12. Anxiety												1.000	.358	.089	.022	.087	.100	-.043	-.042	.032
13. Average education of teachers													1.000	.309	-.075	-.238	-.019	.225	.240	.276
14. Number of times named as most innovative														1.000	-.490	-.216	-.228	.448	.272	.451
15. Number of hours principal teaches															1.000	.137	.013	-.827	-.250	-.142
16. Recency of part-time education																1.000	.177	-.099	-.250	-.419
17. Recency of full-time education																	1.000	.128	-.177	-.314
18. Number of elementary classes																		1.000	.166	.117
19. First Index of Innovativeness (I_1)																			1.000	.649
20. Second Index of Innovativeness (I_2)																				1.000

r of .275 is required for significance at the .05 level for a one-tailed test.

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